



Ohio Economic Trends Review

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Premier Issue

Ohio Public Finance Roundtable and Board of Editors

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 James P. Lesage, Bowling Green State University
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The *Ohio Economic Trends Review* is funded by the Urban University Program, which focuses the talents and resources of the state's urban universities on the revitalization efforts of our urban communities. The Ohio General Assembly established the program in 1979 through the Ohio Board of Regents.

The Urban Center at Cleveland State University's College of Urban Affairs was created as a model for university/community linkage efforts. The seven other Ohio urban universities participating in the Urban University Program include the University of Akron, the University of Cincinnati, Kent State University, Ohio State University, the University of Toledo, Wright State University, and Youngstown State University.

The *Ohio Economic Trends Review* is produced by the Fiscal Futures Service of the Cleveland State University College of Urban Affairs and is edited by a Board of Editors. The views expressed are those of the individual authors, and do not necessarily reflect official positions of the Fiscal Futures Service. The authors will be glad to receive comments about their articles.



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Message from the College of Urban Affairs

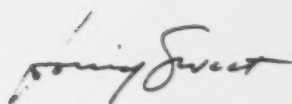
The Urban Center is proud to share this inaugural issue of the *Ohio Economic Trends Review* with you. It is a product of the Fiscal Futures Service, a unit of The Urban Center in The College of Urban Affairs at Cleveland State University. The Urban Center is a part of the state's Urban University Program operated under the auspices of the Ohio Board of Regents and through special funding provided by the Ohio General Assembly. The Fiscal Futures Service is a recent addition to the programs of the Center and was established to specialize in providing and encouraging linkages between the university and state and local public finance officials.

The College of Urban Affairs is committed to extending its education, training, technical assistance, and research and data development capabilities to the community. Its function is to develop and train scholars and practitioners and provide a neutral forum for the exchange of ideas and information as a means of promoting a better understanding of issues and improved analysis of choices facing urban areas. It is particularly in the context of this responsibility that the Fiscal Futures Service was formed and this publication launched. If it answers the need we believe exists, it will continue on a quarterly basis.

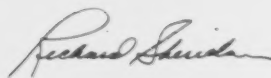
The Fiscal Futures Service engages in the presentation of seminars and workshops on financial topics such as revenue forecasting and the use of microcomputers in budgeting. It also issues a bi-monthly newsletter, *Urban Fiscal Ledger*, which includes articles by public finance practitioners. There is a column, *Budget Bytes*, which appears in the publication, and is also issued separately from time to time, which reports on state-level financial issues. The service is also engaged in research topics and a series of occasional papers are planned for the future.

This new publication is a continuation of the work of the service in linking the state's financial community. In the belief that there is a direct correlation between local, regional and state economic development and public finance the new *Review* will present articles analyzing that connection. This issue presents an economic forecast for six of the metropolitan regions of the state. Utilizing its distinguished Board of Contributing Editors, consisting of academic and non-academic economists and finance experts, there is a section devoted to speculation on the economic expectations for 1985. Future issues will include data and analysis of leading and coincidental economic indicators in an effort to assist in identifying the important turning points in the economy which affect types and levels of revenues and expenditures of governments and business.

It is our sincere hope that this kind of information, provided on a regular basis, will be of assistance to individuals in the public and private sectors engaged in financial and economic planning. We welcome your thoughts and comments for future issues.



David C. Sweet
Dean
College of Urban Affairs



Richard G. Sheridan
Director
Fiscal Futures Service



David F. Garrison
Director
The Urban Center



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Using Economic Indicators in the Budgetary Decision-Making Process /7

An economic indicator is a variable which provides information about another economic variable. If properly constructed, the indicator can be used to predict changes in a related economic variable. In this article, James P. Lesage and Michael Magura demonstrate how indicators work and how they can be used by local government jurisdictions for revenue and expenditure forecasting. The authors demonstrate the process of determining economic relationships and applying those relationships to forecasting payroll receipts. The appendices display tabular and graphic data from the Ohio Department of Development for each Standard Metropolitan Statistical Area (SMSA) and the state.

Ohio Regional Forecasts /21

The theory exists that there is an "Ohio Economy." In reality, the statewide economy is an aggregation of eight separate regional economies, six of which are presented here. As can be seen in the data and graphs in the appendices to the article "Using Economic Indicators in the Budgetary Decision-Making Process," the paths of the economies of the state's SMSAs have differed greatly, especially during the recent recession. To address these differences, economists from around the state, mostly from major universities, have put together brief outlooks for their local economies in calendar year 1985.

Ohio's Changing Economy /25

Since 1978, the economy of Ohio has undergone some dramatic changes. The shift from a heavy manufacturing base to a high-technology and service base has not been easy. In this article, four Cleveland State University scholars examine some of these economic changes and what their effects have been. How Ohio has compared to other parts of the country in the shift from manufacturing to service employment is examined in greater detail, as is the shift from heavy manufacturing to high technology.





Using Economic Indicators in the Budgetary Decision-Making Process

James P. Lesage and Michael Magura*

Introduction

Budget officers frequently need to assess future changes in economic conditions because such changes directly affect both revenues and expenditures. Since the future is not known with certainty, forecasts of future economic conditions need to be made. These can be obtained by using a variety of statistical forecasting techniques or acquiring information about variables which are good indicators of future economic changes.

This article discusses economic indicators and describes how they can be used by individuals concerned with financial and budgetary decisions. The discussion proceeds by first defining what is meant by economic indicators. Some graphical illustrations of how economic indicators can characterize past, present, or future economic conditions are presented. Next, an example of the use of leading indicators in generating a naive forecast of tax revenue for a large, Ohio, metropolitan area is presented. Finally, 1985 forecasts of the economic indicators published by the Ohio Department of Development (ODOD) are presented to assist policy makers in assessing future changes in variables of interest to them.

Economic Indicators

An economic indicator can be defined as a variable which provides information about another economic variable. The indicator provides information in the sense that variations in the indicator are systematically related to another variable and, therefore, knowing variations in the indicator can assist in knowing about variations in the other variable.

This systematic relationship can be contemporaneous, lagging, or leading. That is, variations in the economic indicator can occur at the same point in time as the other variable, after variations in the other variable, or prior to variations in the other variable. These types of indicators are referred to as coincident, lagging, and leading economic indicators, respectively.

Coincident and leading indicators can be of particular interest to policy makers. Coincident indicators are important because, at times, information of interest may not be available whereas that of a coincident indicator may. In this case the coincident indicator can be used as a proxy measure. Leading indicators are important because movements in these variables can be used to forecast movements in the variables of interest. Leading indicators are especially useful in anticipating turnarounds.

Although economic indicators can be quite important, there are two difficulties which should be noted. First, it can be quite difficult to identify appropriate economic indicators for the variable of interest. Sound theory or intuition is required to determine which variables are good indicators of another variable. For example, since construction normally requires a permit prior to the initiation of a project, intuition tells us that the number or value of authorized permits would be a good indicator of construction activity. A second difficulty with economic indicators is that, although they are systematically related to other variables, they are not necessarily related in a precise fashion. That is, although we would expect that increases in the number of permits should lead increases in construction activity, the increases in construction activity need not always occur precisely the same time in the future. There may be other factors which also impact on the level of construction activity.

As an example, let us consider the situation of a budget officer for a large Ohio city. If a large part of the city's tax revenues are obtained from the payroll tax,

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knowing the movements in the total payroll of the metropolitan area can help explain variations in city payroll tax receipts. We would say in this case that total payroll in the SMSA would be a good coincident indicator of local government payroll tax receipts.

Payroll, in turn, is related to other variables. Our economic intuition tells us that payroll would be related to wages paid, hours worked, number of employed, retail sales, and so forth. More specifically, we might expect that as sales increase, firms, after some lag, increase the number of hours worked. If the sales increase persists, employment is finally increased. Payroll, then, would increase at first with increases in hours worked arising from the increased sales and then with increases in employment. However, payroll only increases with some lag after the increase in sales. We could thus view sales as a leading indicator of hours worked, employment, and payroll because variations in sales precede those of the other variables. Hours worked, we might expect, would be fairly coincident with payroll whereas employment would lag payroll, since initial changes in payroll would come from changes in hours.

Figures 1A and 1B illustrate these relationships using quarterly data for the Cleveland SMSA. The raw data for the two figures were available from the Ohio Department of Development (ODOD) for the period 1976 through the first quarter of 1984 and were extended through 1985 using a forecast technique to be described below. The data, as published by ODOD, are deflated and deseasonalized. The quarterly magnitudes for each series

were divided by the value of that series in the first quarter of 1976 to form an index so that the various series would be the same order of magnitude. Further, a five quarter moving average was taken of each series in order to smooth out the quarter-to-quarter fluctuations.

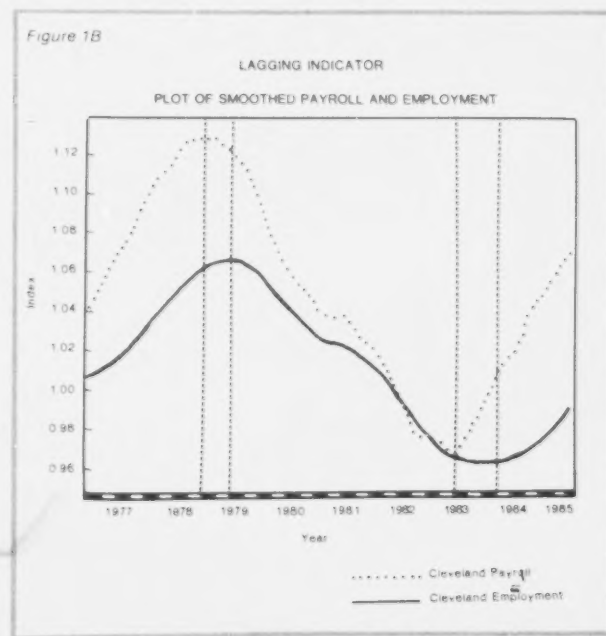
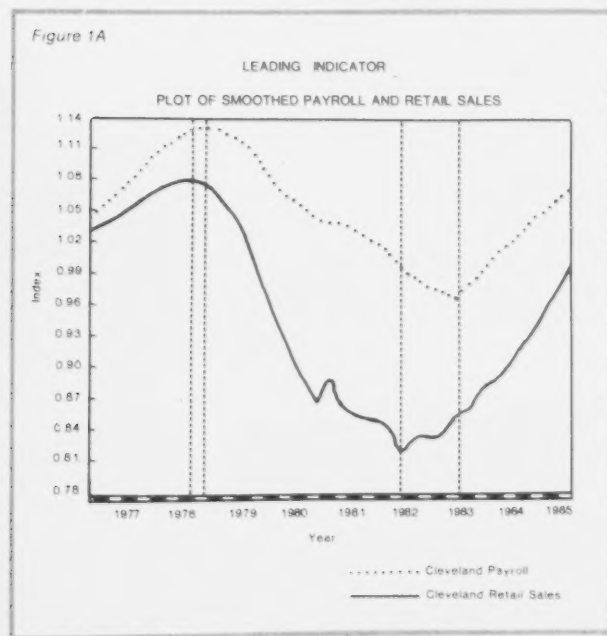
Chart 1a of Figure 1 indicates that Cleveland retail sales are, as expected, a leading indicator of the total Cleveland SMSA payroll. (Vertical reference lines at peaks and troughs have been drawn.) A peak in sales occurred in the third quarter of 1978 (1978Q3), one quarter prior to peak in payroll in 1978Q4. A trough in sales occurred in 1982Q2, four quarters prior to the trough in payroll in 1983Q2. Note, also, the slight upturn in retail sales in 1980Q4 which led to a flattening of payroll in the following quarter.

On average, these peaks and troughs in sales occur 2.5 quarters prior to the peaks and troughs in payroll.

Chart 1b shows that employment is a lagging indicator of payroll. Payroll peaks in 1978Q4 while employment peaks two quarters later in 1979Q2. A trough in payroll occurs in 1983Q2, whereas the trough in employment occurs three quarters later in 1984Q1.

Using Economic Indicators

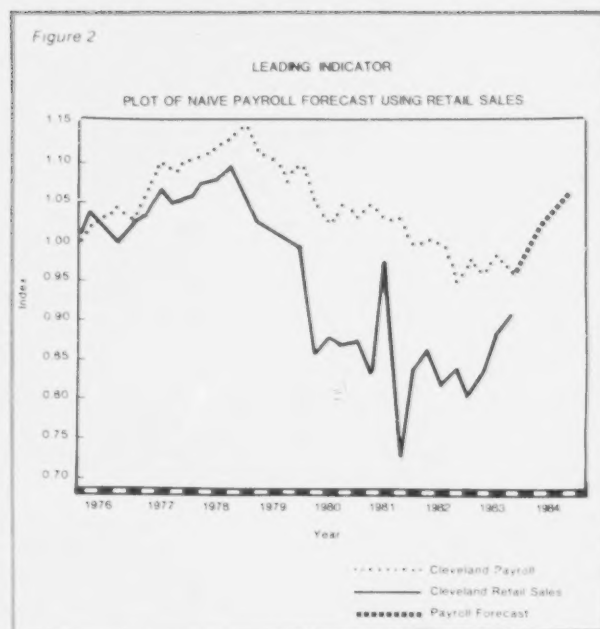
As indicated above, leading indicators can be useful to budget officers in forecasting revenue or expenditure magnitudes. An example is given here to suggest how one might employ leading indicator relationships to obtain a naive forecast.



The first step in utilizing economic indicators to forecast is the identification stage. Here, knowledge of the factors which affect revenue or expenditure magnitudes is vital. A budget officer must use theory or intuition to isolate those variables which are leading indicator candidates. As we have seen, payroll, from which tax revenues are directly derived, has retail sales as one leading indicator. Additional candidates might be new orders, net business formation, and so forth. A good source of potential candidates and the data is *Business Conditions Digest*. This monthly, U.S. Department of Commerce publication presents national data on a large number of variables which have been identified as leading, lagging, or coincident indicators. Similarly, ODOD publishes *Ohio Economic Indicators Quarterly*. This publication presents information on a number of economic indicators for the eight largest metro areas in Ohio as well as those for the state as a whole.

The next part of the identification stage requires that the potential candidates be classified as leading, coincident, or lagging indicators. Although more sophisticated techniques are available, the simplest procedure would be to plot the variable of interest and the candidate indicators. Converting the data to an index form and smoothing it by using a moving average, as we have done, can be quite helpful. Here, one attempts to ascertain the leads or lags between the series.

Once leading indicators have been chosen, the final step would be the forecast stage. As an illustration, we have again chosen the city of Cleveland. Assume that the budget officer in Cleveland knows that the payroll tax revenue of the city is closely related to the level of payroll. He consults ODOD publications and obtains quarterly data for payroll in the Cleveland metro area and that for a number of potential leading indicators. Following procedures similar to those outlined above, he identifies retail sales in Cleveland as a good leading indicator. Figure 2 presents total payroll for Cleveland from 1976 through 1983 in index form as the red line. Retail sales, also in index form, are plotted as the blue line. Note that Figure 2 does not present the data in moving average terms to facilitate the calculation of the magnitude of the payroll forecast. Recognizing that retail sales lead payroll by an average 2.5 quarters (recall Figure 1), the budget officer would extend (forecast) the payroll line through 1984 based upon movements in retail sales over the previous 2 or 3 quarters. Since retail sales were increasing throughout 1983, the forecast would be the line shown as the dashed in Figure 2. Note that what is being done in Figure 2 to obtain the forecast is to use the observed relationship between retail sales and payroll over past quarters and to extrapolate it into the future. This technique is, of course, somewhat imprecise. However, it does represent an inexpensive and relatively easy procedure to use to identify general movements and to signal turnarounds in the variable of interest.



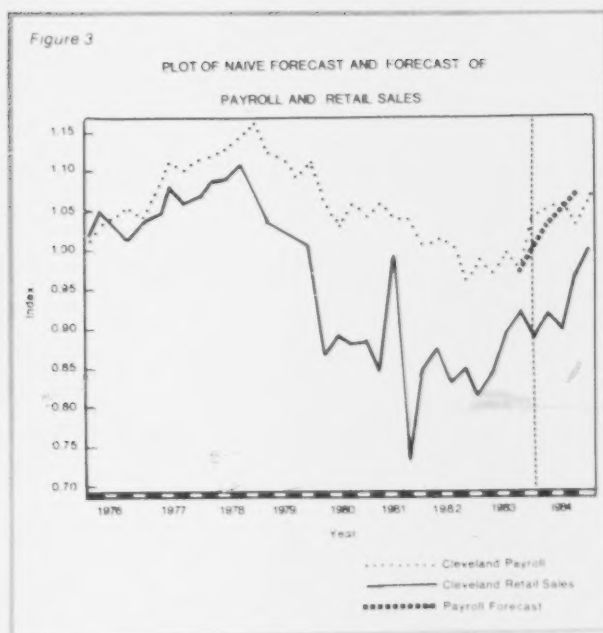
Forecasts of Economic Indicators

Forecasts of a variable of interest to a budget officer, such as payroll tax revenues, need to be made in a timely fashion. Unfortunately, data for economic indicators, such as those compiled by ODOD, are published only with a lag. For example, at this writing the most recent figure for the ODOD indicators is 1984Q1.

For this reason we have constructed a vector autoregressive (VAR) econometric model to forecast the indicators published by ODOD¹. With this model we have forecast the six economic indicators for each of the eight largest metro areas in Ohio as well as those for the state as a whole. These forecasts, along with historical data from 1976Q1, are presented in the Data Appendix, Tables 1 through 9. Each series has been converted to an index with a base of 1976Q1. This should facilitate their use in a replication of the procedures described above. We anticipate that these forecasts will be updated in future issues of this journal.

In order to indicate the usefulness of the naive forecasting technique described in the previous section, Figure 3 compares the naive forecast for the Cleveland metro area presented in Figure 2 with the actual value for

¹ Simply put, a VAR model is a time-series model in which the dependent variable is related to its own past values as well as past values of other independent variables. Additional information about the model is available from the authors upon request.



1984Q1 and the more sophisticated forecast from the VAR model. The vertical reference line at 1984Q1 demarcates the actual, historical data from the forecast data. Again, payroll, in index form, is presented as the red line; retail sales, as the blue line; and, the naive forecast, as the dashed green line. Note that the naive forecast values are below the actual and sophisticated forecast values for two quarters, quite close for one quarter, and above for one quarter. On balance, the naive forecast characterizes the actual and sophisticated forecast values quite well.

Concluding Remarks

Economic indicators are widely used by policy makers in assessing future changes in economic conditions. This article has discussed what economic indicators are and has described how indicators can be used in a rather simple fashion to forecast variables which might be of interest to budget officers. Also, forecasts of ODOD economic indicators have been presented in the hope that they will provide budget officers with up-to-date to enable them to make timely forecasts.

Although the techniques described here can prove very useful, the simple approach to the application of economic indicators should not be viewed as a substitute for more sophisticated econometric forecasting. Rather, it should be construed as merely an additional piece of information in the budgetary decision-making process. Further, some of the difficulties with the approach suggested here should be kept in mind. First, appropriate indicators may be difficult to define. Second, the relationship between an indicator and a variable of interest is usually not a very precise one. Finally, because history does not always repeat itself exactly, a certain degree of error is to be expected. If these cautions are kept in mind, the application of the techniques described here can prove to be a useful and simple addition to the budgetary decision-making process.

APPENDICES

Each of the nine appendices contains three items: The first is a table of both historical data and forecasts for five economic indicators. The data are in the form of indices, with 1976, quarter one, equal to one. With the exception of employment, the indices are both seasonally adjusted and adjusted for inflation over time.

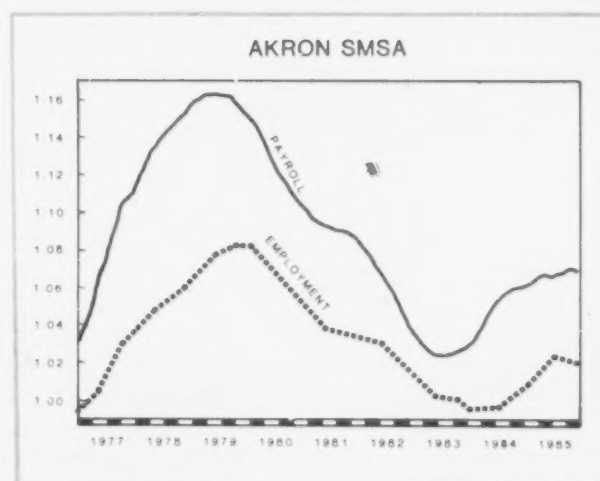
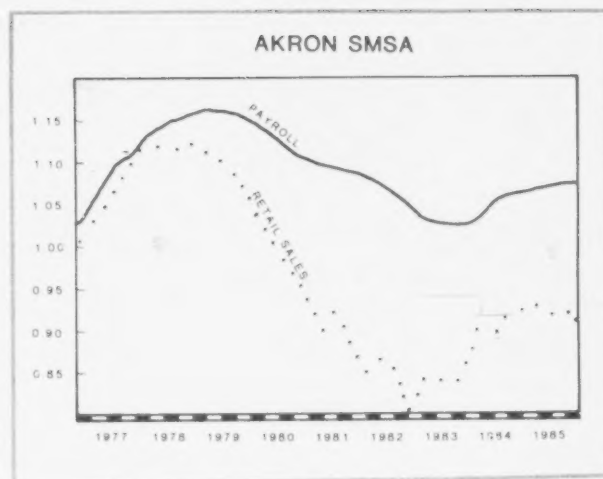
The second item is the nominal value of each economic indicator for the first quarter of 1976. This allows the reader to calculate the value of an indicator at any point in time. It would be done by taking the value in 1976, quarter one, and multiplying it by the corresponding index value from the table. For instance, to calculate employment in Akron for 1985-1, one would take the employment index from the table in Appendix 1 (1.039) and multiply it by the employment level at 1976-1 (250,060) to come up with the forecast of 259,812.

The final item consists of two graphs which are identical to Figures 1a and 1b in the text. The data points will not exactly match those in the tables because of a smoothing technique used on the data. The use of such a technique helps to show the relationships among the variables. The method of smoothing used is a five quarter moving average. That is, the value of the first point in each graph 1977-1, is actually the average of the values of 1976-1, 1976-2, 1976-3, 1976-4 and 1977-1. The next point is the average of 1976-2, 1976-3, 1976-4, 1977-1 and 1977-2. The last point, using this progression, is 1985-4.

Appendix 1 Akron SMSA

Historical Data and Forecasts

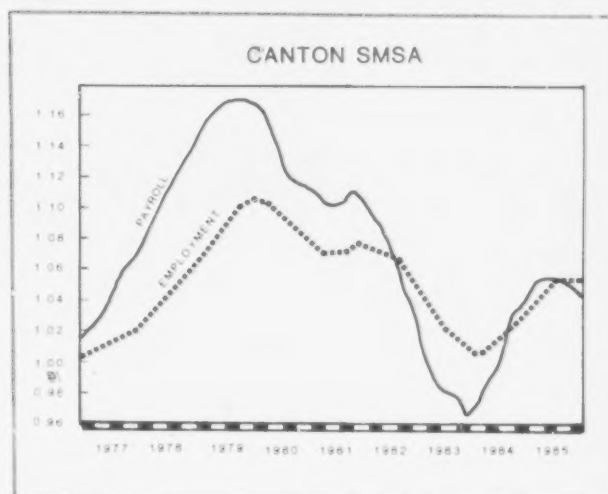
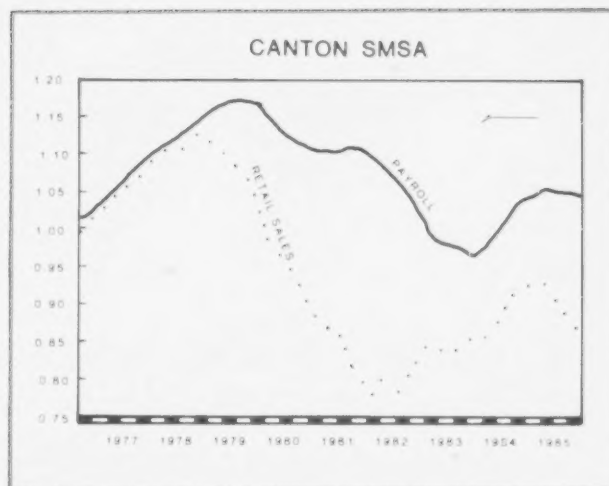
Leading Quarter	Housing Values	Retail Sales	Payroll	Commercial Loans	Employment
1976-1	1 000	1 000	1 000	1 000	1 000
1976-2	949	1 020	1 007	967	975
1976-3	1 195	953	993	974	972
1976-4	1 449	995	1 104	1 022	1 005
1977-1	1 890	1 031	1 041	993	1 015
1977-2	2 068	1 112	1 109	1 020	1 034
1977-3	1 864	1 156	1 142	1 020	1 045
1977-4	1 398	1 072	1 128	1 061	1 041
1978-1	1 890	1 138	1 139	1 148	1 048
1978-2	1 814	1 111	1 154	1 166	1 063
1978-3	1 814	1 109	1 157	1 162	1 066
1978-4	1 864	1 143	1 171	1 206	1 069
1979-1	1 297	1 089	1 180	1 122	1 084
1979-2	2 025	1 092	1 153	948	1 086
1979-3	1 305	1 062	1 153	961	1 089
1979-4	1 093	1 036	1 134	839	1 087
1980-1	797	1 004	1 135	789	1 068
1980-2	695	899	1 100	740	1 050
1980-3	805	935	1 086	717	1 041
1980-4	1 076	958	1 100	576	1 039
1981-1	678	877	1 086	630	1 033
1981-2	619	826	1 100	658	1 038
1981-3	483	1 014	1 084	623	1 039
1981-4	322	705	1 073	652	1 032
1982-1	347	817	1 051	663	1 026
1982-2	305	953	1 044	671	1 015
1982-3	525	781	1 032	609	1 012
1982-4	542	755	1 013	662	992
1983-1	746	897	1 009	657	997
1983-2	788	817	1 020	679	994
1983-3	559	937	1 054	619	1 009
1983-4	780	880	1 044	650	991
1984-1	665	972	1 084	691	994
FORECAST STARTS HERE					
1984-2	991	868	1 061	739	996
1984-3	967	936	1 058	775	1 020
1984-4	1 000	957	1 057	733	1 040
1985-1	769	904	1 077	727	1 039
1985-2	579	909	1 081	700	1 018
1985-3	624	886	1 078	751	998
1985-4	986	901	1 065	798	1 002
Nominal Values					
1976-1	14,585	175.0	423,986	146,776	250,060



Appendix 2 Canton SMSA

Historical Data and Forecasts

Leading Quarter	Housing Values	Retail Sales	Payroll	Commercial Loans	Employment
1976-1	1.000	1.000	1.000	1.000	1.000
1976-2	1.402	.989	1.008	1.021	.996
1976-3	1.620	.993	1.024	.946	1.012
1976-4	1.804	1.011	1.033	.985	1.008
1977-1	2.380	1.001	1.009	.954	1.003
1977-2	2.478	1.009	1.043	.975	1.016
1977-3	2.413	1.082	1.085	.924	1.023
1977-4	2.402	1.075	1.104	.970	1.036
1978-1	2.380	1.097	1.106	.994	1.042
1978-2	2.457	1.136	1.117	1.017	1.056
1978-3	2.576	1.127	1.137	.950	1.063
1978-4	2.120	1.090	1.159	.997	1.079
1979-1	2.043	1.180	1.194	.995	1.098
1979-2	2.348	1.049	1.182	1.011	1.105
1979-3	1.696	1.046	1.173	.946	1.117
1979-4	1.880	1.044	1.140	.957	1.108
1980-1	1.283	.965	1.162	.910	1.100
1980-2	.663	.830	1.120	.843	1.084
1980-3	1.315	.921	1.062	.776	1.052
1980-4	1.185	.924	1.100	.847	1.072
1981-1	1.283	.817	1.117	.779	1.077
1981-2	1.043	.867	1.118	.741	1.077
1981-3	.609	.767	1.108	.767	1.079
1981-4	.674	.670	1.119	.864	1.078
1982-1	.424	.809	1.044	.773	1.064
1982-2	.446	.882	1.037	.746	1.054
1982-3	.902	.813	1.024	.707	1.047
1982-4	.522	.893	.971	.804	1.009
1983-1	.728	.823	.957	.843	1.010
1983-2	.891	.789	.934	.842	1.008
1983-3	.837	.882	1.009	.801	1.014
1983-4	.641	.884	.965	.901	1.000
1984-1	.562	.906	1.043	.867	1.005
FORECAST STARTS HERE					
1984-2	.907	.952	1.061	.912	1.051
1984-3	1.204	.943	1.069	.843	1.055
1984-4	.557	.950	1.055	.857	1.065
1985-1	.468	.888	1.050	.808	1.048
1985-2	.427	.812	1.038	.857	1.051
1985-3	.610	.809	1.045	.844	1.050
1985-4	.803	.837	1.037	.885	1.057
Nominal Values					
1976-1	6,716	126.0	269,505	92,841	145,883

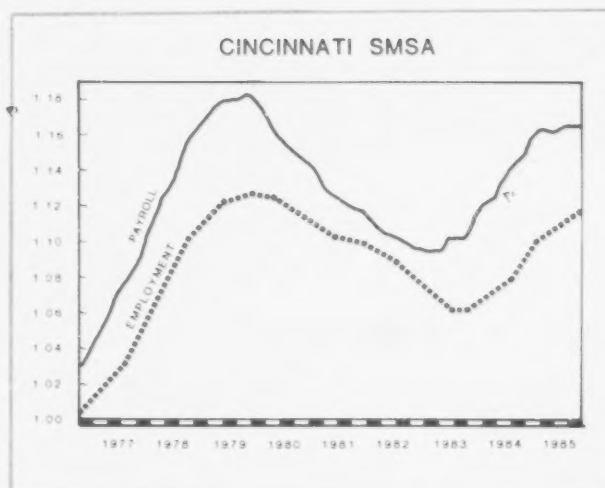
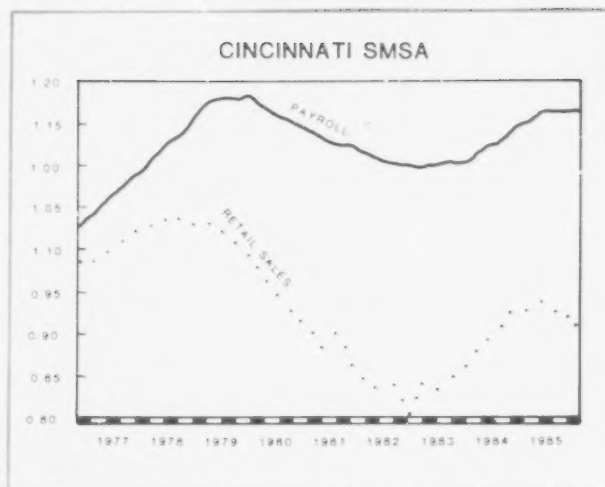




Appendix 3 Cincinnati SMSA

Historical Data and Forecasts

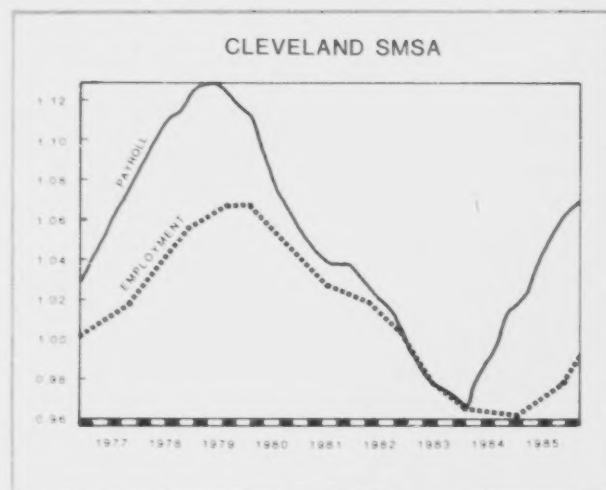
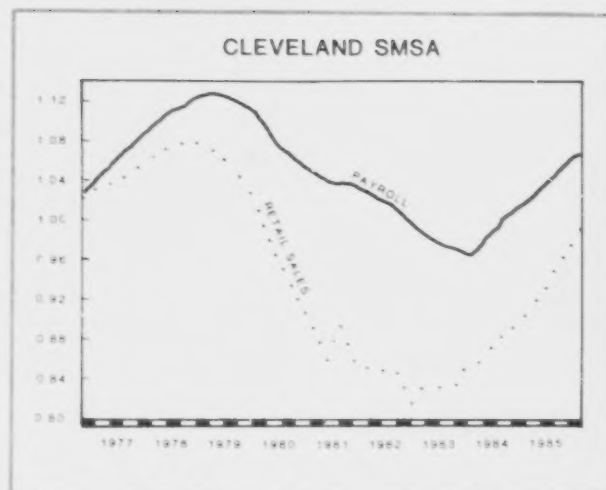
Leading Quarter	Housing Values	Retail Sales	Payroll	Commercial Loans	Employment
1976-1	1 000	1 000	1 000	1 000	1 000
1976-2	799	976	1 022	987	1 000
1976-3	799	977	1 026	996	1 003
1976-4	1 097	949	1 063	1 008	1 005
1977-1	1 060	1 015	1 031	1 027	1 019
1977-2	1 179	1 008	1 067	1 062	1 032
1977-3	1 351	1 026	1 106	1 075	1 045
1977-4	1 067	1 039	1 103	1 092	1 052
1978-1	1 433	1 006	1 121	1 223	1 073
1978-2	1 336	1 051	1 143	1 209	1 095
1978-3	1 410	1 047	1 160	1 164	1 111
1978-4	1 112	1 029	1 178	1 150	1 119
1979-1	1 149	1 012	1 203	1 153	1 120
1979-2	1 373	1 012	1 181	1 120	1 123
1979-3	970	997	1 170	1 083	1 130
1979-4	1 179	986	1 161	1 055	1 133
1980-1	642	938	1 191	1 013	1 129
1980-2	433	882	1 136	946	1 115
1980-3	776	879	1 126	905	1 104
1980-4	888	932	1 136	949	1 105
1981-1	634	902	1 122	874	1 107
1981-2	560	802	1 127	844	1 102
1981-3	373	991	1 109	601	1 098
1981-4	276	679	1 112	856	1 095
1982-1	448	824	1 087	870	1 088
1982-2	306	854	1 092	844	1 084
1982-3	328	836	1 112	850	1 082
1982-4	478	817	1 084	854	1 058
1983-1	716	870	1 104	911	1 057
1983-2	567	796	1 085	941	1 056
1983-3	761	937	1 131	958	1 060
1983-4	604	888	1 110	1 031	1 072
1984-1	690	950	1 170	1 050	1 083
FORECAST STARTS HERE					
1984-2	862	923	1 141	1 023	1 090
1984-3	816	955	1 164	1 004	1 101
1984-4	926	925	1 168	1 039	1 110
1985-1	700	930	1 178	1 030	1 117
1985-2	805	899	1 160	980	1 117
1985-3	719	895	1 159	940	1 121
1985-4	621	884	1 160	940	1 119
Nominal Values					
1976-1	43,183	341.4	825,394	358,507	539,721



Appendix 4 Cleveland SMSA

Historical Data and Forecasts

Leading Quarter	Housing Values	Retail Sales	Payroll	Commercial Loans	Employment
1976-1	1 000	1 000	1 000	1 000	1 000
1976-2	886	1 047	1 026	927	1 001
1976-3	879	1 026	1 036	937	1 001
1976-4	1 100	1 009	1 049	997	1 003
1977-1	1 200	1 031	1 033	931	1 008
1977-2	1 207	1 044	1 067	917	1 016
1977-3	1 414	1 077	1 104	950	1 025
1977-4	1 171	1 056	1 097	949	1 030
1978-1	1 336	1 062	1 109	984	1 038
1978-2	1 364	1 083	1 114	995	1 054
1978-3	1 157	1 087	1 125	985	1 057
1978-4	1 143	1 101	1 135	955	1 067
1979-1	1 050	1 062	1 154	952	1 068
1979-2	1 136	1 032	1 117	943	1 067
1979-3	800	1 020	1 109	971	1 072
1979-4	743	1 012	1 084	925	1 064
1980-1	464	992	1 104	903	1 063
1980-2	286	859	1 052	805	1 039
1980-3	450	883	1 024	783	1 023
1980-4	721	875	1 049	787	1 031
1981-1	400	878	1 034	739	1 026
1981-2	450	834	1 049	708	1 025
1981-3	393	983	1 032	731	1 021
1981-4	229	723	1 030	746	1 016
1982-1	214	838	998	793	1 008
1982-2	243	866	1 002	804	1 001
1982-3	229	820	999	874	990
1982-4	307	839	950	888	969
1983-1	521	803	971	893	963
1983-2	514	832	962	871	963
1983-3	600	881	983	905	961
1983-4	536	910	963	936	965
1984-1	589	877	1 030	905	966
FORECAST STARTS HERE					
1984-2	745	904	1 041	899	961
1984-3	920	886	1 046	904	960
1984-4	1 026	956	1 020	889	970
1985-1	1 036	992	1 053	871	986
1985-2	982	1 011	1 085	858	995
1985-3	1 027	1 007	1 101	871	997
1985-4	1 137	1 012	1 092	875	1 002
Nominal Values					
1976-1	55,657	470.3	1,558,958	1,146,470	861,896



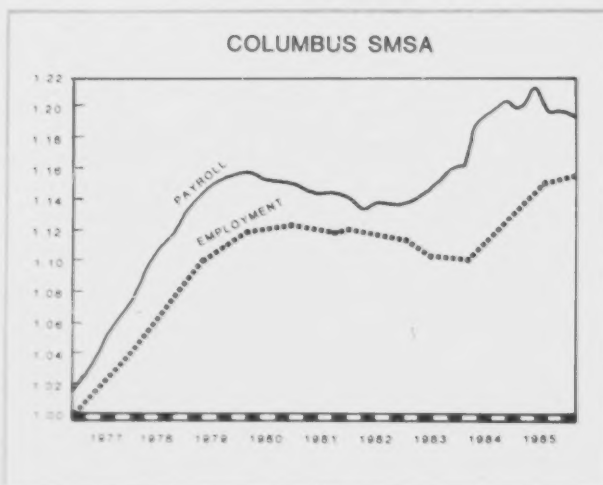
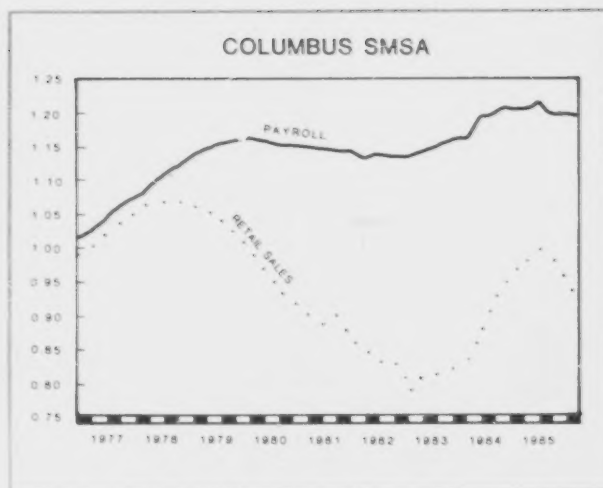
Appendix 5 Columbus SMSA

Historical Data and Forecasts

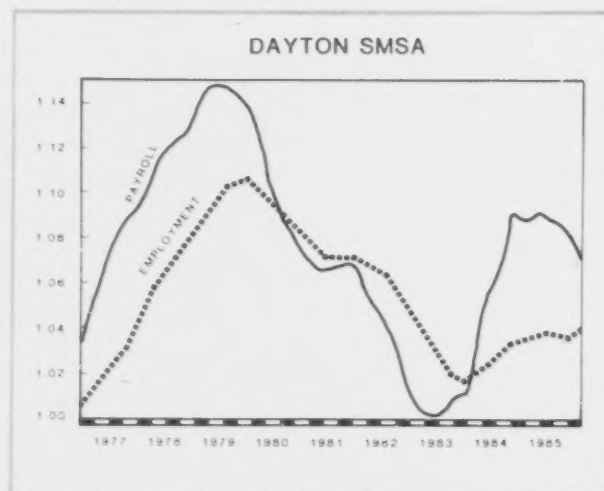
Leading Quarter	Housing Values	Retail Sales	Payroll	Commercial Loans	Employment
1976-1	1.000	1.000	1.000	1.000	1.000
1976-2	936	946	1.003	945	997
1976-3	993	982	1.020	955	1.003
1976-4	965	970	1.038	1.000	1.011
1977-1	1.305	1.020	1.018	1.084	1.010
1977-2	1.355	1.059	1.056	1.099	1.031
1977-3	1.262	1.059	1.101	1.130	1.045
1977-4	1.326	1.066	1.086	1.169	1.048
1978-1	1.411	1.042	1.099	1.244	1.065
1978-2	1.397	1.095	1.126	1.281	1.084
1978-3	1.284	1.062	1.135	1.225	1.092
1978-4	1.270	1.065	1.146	1.200	1.104
1979-1	1.170	1.027	1.168	1.341	1.106
1979-2	1.291	1.012	1.153	1.929	1.111
1979-3	1.284	1.008	1.157	1.941	1.120
1979-4	1.149	964	1.155	2.059	1.126
1980-1	872	941	1.163	2.138	1.132
1980-2	596	889	1.141	2.071	1.123
1980-3	1.021	856	1.140	2.024	1.112
1980-4	1.085	932	1.155	2.020	1.125
1981-1	830	884	1.136	2.024	1.120
1981-2	617	845	1.146	2.016	1.120
1981-3	411	970	1.132	2.016	1.117
1981-4	206	669	1.139	2.179	1.121
1982-1	333	854	1.113	2.262	1.115
1982-2	418	818	1.150	2.304	1.113
1982-3	482	820	1.148	2.316	1.111
1982-4	681	761	1.130	2.468	1.096
1983-1	1.057	795	1.162	2.572	1.098
1983-2	794	859	1.160	2.589	1.102
1983-3	1.085	869	1.199	2.473	1.097
1983-4	1.050	890	1.157	2.666	1.110
1984-1	1.483	971	1.281	2.600	1.130
FORECAST STARTS HERE					
1984-2	1.270	1.050	1.193	2.899	1.139
1984-3	1.089	1.030	1.195	2.866	1.139
1984-4	956	953	1.176	2.828	1.163
1985-1	793	989	1.223	2.794	1.162
1985-2	776	888	1.199	2.914	1.154
1985-3	709	876	1.193	2.913	1.145
1985-4	785	845	1.180	2.873	1.149

Nominal Values

1976-1	36.638	336.6	717.936	283.309	454.072
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Historical Data and Forecasts

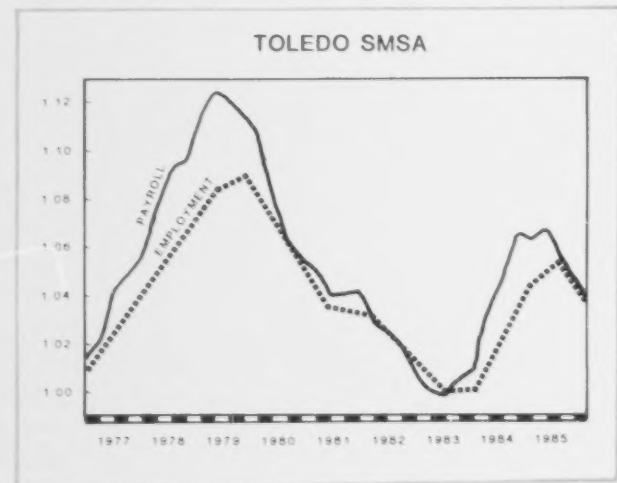
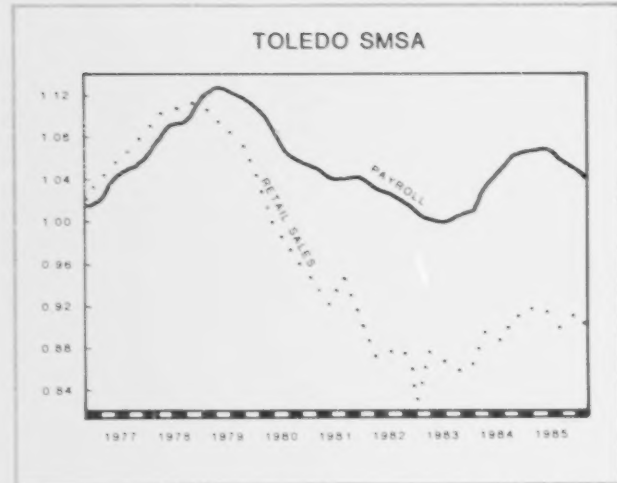




Appendix 7 Toledo SMSA

Historical Data and Forecasts

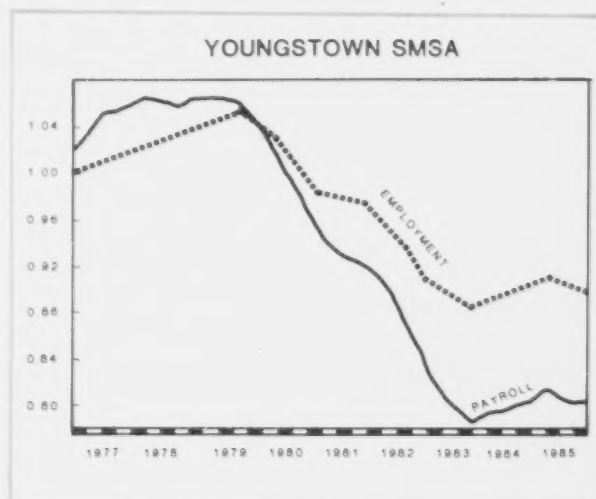
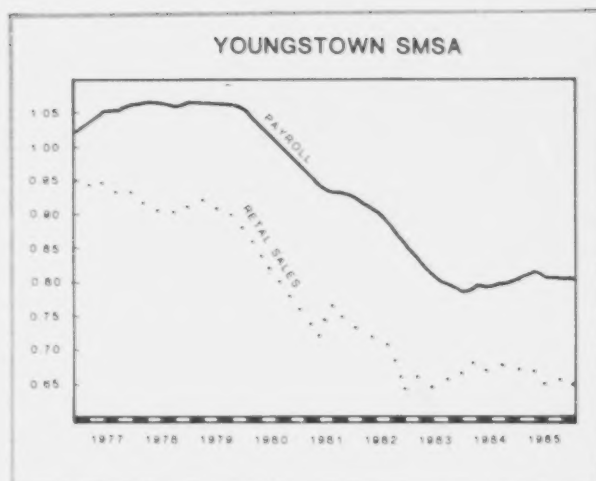
Leading Quarter	Housing Values	Retail Sales	Payroll	Commercial Loans	Employment
1976-1	1 000	1 000	1 000	1 000	1 000
1976-2	853	1 007	994	1 027	1 005
1976-3	799	1 031	1 030	990	1 008
1976-4	951	1 022	1 036	1 000	1 009
1977-1	941	1 040	1 010	1 109	1 018
1977-2	1 078	1 093	1 033	1 032	1 034
1977-3	1 108	1 082	1 102	1 117	1 043
1977-4	936	1 090	1 065	1 120	1 049
1978-1	1 172	1 095	1 077	1 195	1 054
1978-2	1 196	1 124	1 104	1 184	1 062
1978-3	1 083	1 117	1 108	1 207	1 075
1978-4	1 064	1 102	1 124	1 214	1 085
1979-1	892	1 132	1 161	1 219	1 095
1979-2	1 020	998	1 123	1 186	1 092
1979-3	1 083	1 073	1 088	1 130	1 088
1979-4	770	1 044	1 074	971	1 083
1980-1	608	958	1 090	963	1 061
1980-2	525	899	1 040	894	1 036
1980-3	706	898	1 022	936	1 029
1980-4	1 010	984	1 051	914	1 033
1981-1	000	951	1 046	857	1 032
1981-2	549	843	1 041	856	1 040
1981-3	353	1 048	1 043	888	1 034
1981-4	230	704	1 024	896	1 023
1982-1	172	817	994	917	1 019
1982-2	377	971	1 020	937	1 012
1982-3	368	828	1 013	938	1 010
1982-4	304	830	982	826	993
1983-1	397	910	992	919	996
1983-2	525	797	985	912	994
1983-3	529	910	1 057	930	1 009
1983-4	441	863	1 031	992	1 016
1984-1	394	997	1 100	1 010	1 034
FORECAST STARTS HERE					
1984-2	470	846	1 066	990	1 046
1984-3	597	928	1 071	970	1 062
1984-4	647	944	1 047	958	1 060
1985-1	598	845	1 050	977	1 046
1985-2	539	917	1 043	983	1 055
1985-3	528	908	1 028	982	1 011
1985-4	563	888	1 016	961	1 004
Nominal Values					
1976-1	24,172	170.5	413,220	176,315	281,940



Appendix 8 Youngstown SMSA

Historical Data and Forecasts

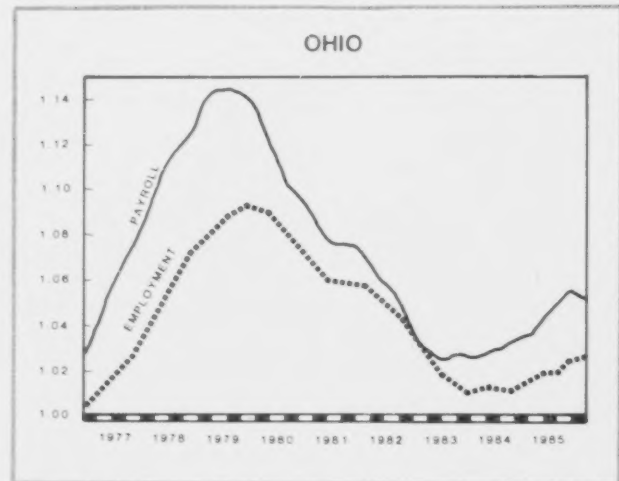
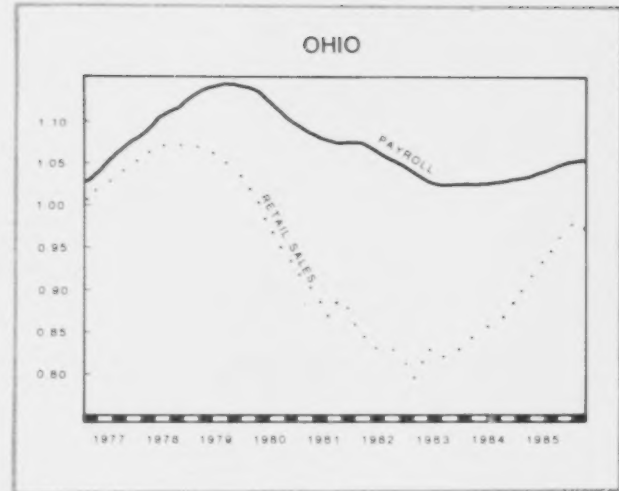
Leading Quarter	Housing Values	Retail Sales	Payroll	Commercial Loans	Employment
1976-1	1,000	1,000	1,000	1,000	1,000
1976-2	1,234	923	1,011	1,033	1,000
1976-3	1,546	935	1,035	1,000	997
1976-4	1,752	864	1,026	1,025	992
1977-1	1,950	1,026	1,032	991	1,008
1977-2	2,461	955	1,068	927	1,025
1977-3	1,504	938	1,100	914	1,028
1977-4	1,163	866	1,044	922	1,027
1978-1	1,844	855	1,059	951	1,019
1978-2	1,752	934	1,056	962	1,032
1978-3	1,638	917	1,056	953	1,042
1978-4	1,617	923	1,076	1,042	1,047
1979-1	1,489	897	1,075	1,058	1,053
1979-2	1,426	914	1,059	1,107	1,051
1979-3	1,418	877	1,053	1,078	1,055
1979-4	1,142	883	1,047	1,051	1,054
1980-1	518	780	1,027	1,011	1,036
1980-2	525	723	980	982	999
1980-3	894	733	939	1,004	978
1980-4	986	749	947	920	976
1981-1	943	744	917	903	978
1981-2	688	649	929	967	986
1981-3	397	946	922	903	982
1981-4	291	581	920	959	964
1982-1	234	713	896	944	942
1982-2	376	666	858	972	926
1982-3	355	612	826	983	913
1982-4	440	632	789	1,014	866
1983-1	638	673	787	967	886
1983-2	539	619	773	1,122	892
1983-3	553	730	798	1,216	900
1983-4	610	656	774	1,314	883
1984-1	501	730	836	1,120	894
FORECAST STARTS HERE					
1984-2	323	566	796	1,168	912
1984-3	562	692	794	1,230	915
1984-4	684	698	822	1,220	909
1985-1	115	644	827	1,187	907
1985-2	130	601	788	1,201	892
1985-3	572	633	787	1,175	889
1985-4	607	650	791	1,171	904
Nominal Values					
1976-1	7,044	100.8	204,644	77,989	203,715



Appendix 9 Eight City Composite

Historical Data and Forecasts

Leading Quarter	Housing Values	Retail Sales	Payroll	Commercial Loans	Employment
1976-1	1.000	1.000	1.000	1.000	1.000
1976-2	.891	1.001	1.015	.956	.998
1976-3	.909	.999	1.027	.959	1.001
1976-4	1.091	.987	1.055	1.003	1.005
1977-1	1.273	1.028	1.027	.990	1.013
1977-2	1.327	1.060	1.068	.988	1.026
1977-3	1.352	1.071	1.108	1.013	1.037
1977-4	1.170	1.062	1.095	1.024	1.042
1978-1	1.364	1.050	1.107	1.085	1.052
1978-2	1.370	1.090	1.122	1.097	1.068
1978-3	1.297	1.073	1.133	1.076	1.076
1978-4	1.206	1.071	1.146	1.064	1.086
1979-1	1.103	1.053	1.169	1.078	1.091
1979-2	1.261	1.020	1.141	1.123	1.092
1979-3	1.012	1.014	1.131	1.120	1.096
1979-4	.958	.993	1.115	1.085	1.095
1980-1	.630	.954	1.129	1.073	1.088
1980-2	.461	.861	1.083	.997	1.069
1980-3	.709	.871	1.064	.970	1.056
1980-4	.867	.908	1.085	.979	1.061
1981-1	.648	.873	1.073	.934	1.059
1981-2	.527	.824	1.082	.916	1.060
1981-3	.376	.966	1.068	.891	1.057
1981-4	.236	.685	1.065	.963	1.052
1982-1	.297	.819	1.033	.991	1.044
1982-2	.309	.860	1.042	1.001	1.037
1982-3	.345	.810	1.040	1.028	1.032
1982-4	.424	.798	1.003	1.055	1.006
1983-1	.655	.826	1.022	1.081	1.008
1983-2	.600	.810	1.013	1.082	1.006
1983-3	.606	.891	1.057	1.055	1.015
1983-4	.618	.884	1.032	1.159	1.017
1984-1	.569	.868	1.010	1.176	1.014
FORECAST STARTS HERE					
1984-2	.762	.866	1.031	1.180	1.004
1984-3	.998	.927	1.035	1.146	1.009
1984-4	1.115	1.026	1.069	1.203	1.038
1985-1	1.164	.951	1.068	1.223	1.026
1985-2	.988	.987	1.041	1.202	1.020
1985-3	1.148	.955	1.062	1.163	1.029
1985-4	1.156	.904	1.020	1.165	1.015
Nominal Values					
1976-1	215,288	1,911.6	4,956,768	2,448,402	3,067,101





Ohio Regional Forecasts

One of the purposes of this journal is to provide information about the economies of the eight major regions of the state. In this first issue, we are providing overviews of 1985 for six of the eight regions (Akron and Canton were not available). In future issues, we will present more detailed information, provided by university economists in each region.

Cincinnati Metropolitan Area*

By Saul Pleeter
University of Cincinnati

The year 1985 should see continued growth for the Cincinnati/Metropolitan area. Although the rate of growth of Gross Regional Product will be 3.4 % compared with an estimated 5.6% rate of growth in 1984, this lowered growth is consistent with 1985 being the third year of an economic recovery.

Unemployment will continue to decrease and is estimated to average 7.5% in 1985. This is a significant change if one realizes that in 1982 the unemployment rate reached 12.3%.

Prices in the metropolitan area are forecast to increase at a rate less than the national average (4.0% compared with 4.5% for the nation) and only slightly higher than the estimated 3.7% for 1984.

Retail sales, auto sales, and housing starts are also forecast to grow at rates slightly less than those realized in 1984.

Personal income is also forecast to grow at a rate slightly less than the national average in 1985 (7.5% vs. 7.7%). In part this will reflect continued recovery in the goods producing industries.

In sum, the Cincinnati area is expected to follow the national trend of lowered rates of growth in 1985. Consumer demand should remain strong and barring any dramatic increases in interest rates, 1985 will be a year of continued recovery.

*The Cincinnati Metropolitan Statistical Area includes Hamilton, Clermont and Warren Counties, Ohio; Boone, Campbell and Kenton Counties, Kentucky; and Dearborn County, Indiana.

Cleveland Metropolitan Area*

By James M. Trutko
Greater Cleveland Growth Association

The Cleveland area economy should continue to show slight improvement in 1985 as the U.S. recovery from the recession moves into its third year. With a forecast annual national growth rate for real GNP in the 3% to 3.5% range in 1985, total employment in the Cleveland MSA should rise to the 840,000 level in 1985, up from an average of 828,000 in 1984.**

Employment in the manufacturing sector of Cleveland's economy will rise to 215,000 in 1985 from a 1984 level of 210,700. This modest growth will occur as national levels of industrial production rise by about 4% in 1985 (versus 1984 increase of 11.2%) and relatively strong capital spending for modernization continues to strengthen demand in Cleveland's producer durables sector.

The gains in the manufacturing sector will be limited, however, by several factors which will hold manufacturing employment far below the pre-recession (1978-79) level of 275,000. Total car sales in the U.S. are expected to drop slightly, curtailing the demand for appliances and other housing supplies important to Cleveland's manufacturing economy.

In the auto and housing-related sectors, and in several of the machinery and industrial equipment sectors, pressures for productivity improvement and for restraining total labor costs will mean that gains in manufacturing employment will come slowly, even if demand increases. The pressure is partly the result of strong international competition which has intensified in many industrial and consumer durables markets because of the strong U.S. dollar. A significant weakening of the U.S. dollar could mean sharp increases in demand for domestically produced durables, although gains may be limited to some degree by higher prices and interest rates.

As a result of some improvement in the local manufacturing sector and in local consumer income, employment in Cleveland's nonmanufacturing sector will grow slightly in 1985. Employment will rise to about

*The Cleveland Metropolitan Statistical Area (MSA) includes Cuyahoga, Geauga, Lake and Medina counties.

**1984 averages in this report are based on the ten month period January-October, and were the most current available at the time of publication.



625,000 (from a 1984 level of 618,000) which will still be below the historical high of 643,500 reached in 1979. The area's business service sector will continue to grow as it has, even through the recession. Some growth will come in the retail sector because low interest rates, the economic recovery, and the rise in real personal income have strengthened consumer confidence and the consumer's purchasing power. Gains in the retail sector and in the finance, insurance, and real estate sector will be limited by the efforts of consumer service companies to improve productivity, by the region's continued loss of population and by the area's unemployment rate which exceeds the national average.

Although health services employment has grown strongly over the past decade, reflecting increases in demand for health care, employment in this sector will probably stabilize (or even decline) in 1985 because efforts at cost containment by government and the private sector seem to be resulting in the facility consolidation.

Columbus Metropolitan Area*

By Henry L. Hunker
The Ohio State University

The Columbus MSA economy is more characteristic of the "post-industrial" society than that of any other major Ohio MSA. The Columbus MSA has differed from other Ohio MSA's historically in its commitment to public sector employment and related service activities. It supported a traditional industrial base, but the share of employment in manufacturing in the MSA did not compare with traditional industrial centers. In the last decade, these qualities were more firmly established as employment in manufacturing decreased from 29% of total employment in 1972 to approximately 19% currently. At the same time, service sector employment increased sharply. Since 1978, the Columbus MSA accounted for almost one-third of the 85,000+ new jobs created in the service sector in Ohio. Clearly, the Columbus MSA leads the national trend towards increased reliance upon service-producing employment and a decreased dependence upon goods-producing employment. The list of major employers reflects this: government, public education, financial services, insurance, wholesale and retail trade, and distribution. Closely related has been the city's growth as a regional and/or national headquarters for firms in insurance, banking and financial services, and fast foods.

These trends support the fact that the Columbus MSA has weathered the cyclical and structural changes in the economy reasonably well during the past ten years.

*The Columbus Metropolitan Statistical Area includes Franklin, Delaware, Union, Madison, Pickaway, Fairfield and Licking Counties.

With a more modest manufacturing employment base than other Ohio cities and with the absence of many facets of Ohio's heavy industrial economy (i.e., steel, basic chemicals, automobiles), the Columbus MSA has adapted more readily to the structural changes in employment reflected in an expanded service sector and was affected less severely by national cyclical trends than were other Ohio cities. Unemployment in the Columbus MSA, for example, has been lower, generally, than the state average (in late 1984, the Columbus/Franklin County unemployment rate of 6.7% was the lowest of any of Ohio's eight major MSA's), and it has been the only major urban area in the northeast to maintain population growth during the last twenty-five years. This experience, supported by an aggressive annexation policy, is weakening so that Columbus' growth rate — projected to be 0.3% per year through the rest of this decade — is stabilizing although population growth in the outlying MSA counties remains fairly dynamic.

Currently, the Columbus MSA is enjoying spirited growth. Continued expansion of its service-based economy is anticipated; the long-term future of manufacturing in the area is not clear at this time, however. New and planned construction in the Columbus Business District (CBD) mirrors the confidence in the city and region's future. In the 1970's, \$685 million was invested in construction in the CBD, expectations are that in excess of \$900 million will be invested in the downtown in the 1980s. With new office buildings, hotels, and related shopping facilities underway or in the planning stage, and with expansion and improvement of the city's cultural activities and riverfront development in progress, there is considerable optimism regarding Columbus's future.

Dayton Metropolitan Area*

By John E. Weiler
University of Dayton

The Dayton economy performed very well during 1984. The unemployment rate fell from 8.8% (November 1983) to 7.4% (November 1984). Both manufacturing and nonmanufacturing employment increased. The recovery in the auto industry has been an important element in the manufacturing area. It is this recovery, rather than an expansion, which accounts for the increase in manufacturing employment during 1984.

1985 is likely to be a period of modest growth. The two major area employers, General Motors and Wright Patterson Air Force Base, are likely to maintain or increase employment. An increase in employment of 1,200 is expected when a second shift is added at GM's

*The Dayton Metropolitan Statistical Area includes Montgomery, Miami, Clark and Greene Counties.

Moraine truck plant. There is some promise of growth in high technology areas. However, this will not produce significant overall growth in manufacturing employment during the period.

Nonmanufacturing employment should rise slightly during 1985. One negative factor is a decline in the rate of expansion in retail sales and employment. One of Dayton's major clothing stores has gone out of business. There has been a modest influx of new retailers, but that will not be repeated in 1985.

Toledo Metropolitan Area*

By Michael Magura
University of Toledo

In addition to large service and retail sectors, the Toledo economy consists of many important manufacturing industries: transportation equipment, stone, clay and glass, machinery, fabricated metals, electrical equipment, primary metals, food, chemicals, and petroleum. The Ohio Bureau of Employment Services states that about one-third of the employed residents of the Toledo area work in factories.

Entering the decade of the 80s, the Toledo economy was besieged with difficulties: high unemployment, firms leaving the area, labor disputes, and declining government revenues. At the beginning of the decade, the unemployment rate stood at about 7%, approximately 350,000 people were employed, and \$123 million of residential housing permits were authorized. During July 1980, the unemployment rate increased to 12.4%, mirroring the decline in national economic activity. The first half of 1981 witnessed an improvement in economic conditions only to be followed by a decline in the latter half. The valuation of housing permits authorized declined to \$99 million in 1981. In 1982 unemployment reached 13.4% in March, declined slightly during the middle part of the year, and rose to a high for the year of 14.3% in December. The transportation equipment, stone, clay and glass, fabricated metals, and construction sectors were particularly hard hit. The valuation of authorized housing permits fell to only \$63 million and overall employment in the area fell to a low of 306,000. Eroding local government revenues prompted layoffs and a request by local officials for a payroll tax rate increase, which was finally approved by the voters in June. During the early part of 1983, the unemployment rate continued to rise to an unprecedented 15% in March. The stone, clay and glass, transportation equipment, fabricated metals, and machinery sectors bore the brunt of the increased unemployment.

Although the period 1980 to 1983 brought difficulties to the Toledo economy, the latter half of 1983 witnessed a

rebound. Downtown redevelopment was moving strongly ahead, the transportation equipment sector improved dramatically, fabricated metals likewise improved, as did many of the other sectors. As of the middle of 1984, the unemployment rate had declined to 9%. During the latter half of 1984, economic activity in Toledo remained relatively strong but had begun to level off.

For 1985, the usual first quarter downturn is expected to follow a rather robust fourth quarter of 1984. Much of the drop is expected to occur in the transportation equipment and retail trade sector. The second quarter portends a further but somewhat slower decline prior to some improvement in the third and fourth quarters. Overall, 1985 is expected to show the same slowdown in economic activity that is expected for the national economy.

Youngstown-Warren Metropolitan Area*

By Anthony Stocks and Yih-Wu Liu
Youngstown State University

For the Youngstown-Warren economy, 1984 reveals a flat performance in manufacturing employment. The expected recovery in steel jobs never materialized as rising steel imports, stimulated by an inflated dollar and a sluggish world economy, kept the local steel industry in the doldrums. Similarly, the fabricated metals and machinery sectors suffered from rising imports and lagging exports during 1984. Among the local manufacturing sectors, only transportation equipment proved vigorous. However, there is considerable evidence that rising demand for products in this sector was met through increasing hours of work rather than hiring more workers. As a result, we overestimated employment in transportation equipment, but were very close to actual man-hours in our forecast of this sector. In the case of the nonmanufacturing sectors, employment rose by 5700 from the first to the fourth quarter of 1984. However, this growth is less than the long-run trend in nonmanufacturing jobs in the local economy suggesting that the "ripple effect" from the loss of manufacturing jobs in recent years is showing up as a constraint on these nonmanufacturing sectors.

What is the forecast for the Youngstown-Warren economy for 1985? The slower growth in the national economy is expected to produce a stagnant job market locally. Manufacturing employment is forecast to fluctuate very little in 1985, while virtually no growth is expected in the nonmanufacturing sectors when compared with similar quarters in 1984. As a result, we expect the official unemployment rate to remain in the 11% to 12% range in 1985 with any dips accounted for by net outmigration.

*The Toledo Metropolitan Statistical Area includes Lucas, Fulton, and Wood Counties.

*The Youngstown-Warren Metropolitan Statistical Area includes Mahoning and Trumbull Counties.





Ohio's Changing Economy

By Richard Sheridan, Michael Sobul, Mark Hoffman, and Wilbur Thompson

Officials engaged in budgeting need to understand recent changes in Ohio's economy in order to make short-range revenue and expenditure forecasts and to prepare long-range capital and operating financial plans. Those involved in economic development need the same information in order to select development policies best able to nurture new businesses, foster existing businesses, or induce business relocation. Business interests are also searching for a view of the future, especially in the light of the prolonged decline wrought by the recession which began in 1980, the effects of which are still being felt as we approach another potential downturn in the economy.

Substantial economic changes have occurred in Ohio since 1978. This article describes, in general terms, some of the characteristics which influence the state's economic condition and selects two employment patterns for closer observation.

Although this article deals with the state as a whole, it is clear that the state is a collection of several regions with quite distinct economic characteristics. Future articles will be concerned with regional patterns of development.

The Economy of Ohio

Ohio is the sixth largest state, with a 1980 population of 10,797,630, and is densely populated (263 persons per square mile compared to a U.S. average of 64), with 80% residing in metropolitan areas.¹ But Ohio is not a big city state; slightly more than 40% of its total population lives outside of urban areas or in places with less than 10,000 residents. Less than 25% are in the seven cities with populations over 100,000. In the past 20 years, the state population has become less concentrated with populations in the seven major urban centers growing smaller and the inhabitants becoming increasingly dispersed throughout and beyond metropolitan areas.² During the period between 1970 and 1980 there was a growth of 7.1% in the population of unincorporated areas, thereby bringing their total population nearly equal to that of all 19 cities over 50,000 in population.

Not only is the population declining and moving out of cities, but jobs are also changing. Manufacturing employment has been steadily declining as a percentage of the total. Along with this change has come a decline in the rate of growth of payroll employment. Between 1959 and 1981 national employment grew by nearly 75%, but in Ohio the growth was less than 40%. This loss of high-

paying manufacturing jobs has had a negative impact on personal income.

Ohio's rank in per capita personal income declined from tenth in 1950 to twenty-third in 1981. In the first quarter of 1984, national personal income rose 2.4% while Ohio's rose only 2.2%. This change has resulted in less taxable personal income and lower retail sales, thus providing less tax revenues.

In order to maintain a set standard of living, given lower per capita income, more persons in the household have had to work. Current statistics show that husband-wife households are increasingly likely to have two full-time wage earners. This has been reflected in the workforce; in 1960 31% of Ohio's workers were female, by 1980 the figure had risen to over 41%. However, there is a substantial gap between the incomes of men and women, even with the same education, age, and occupation. Women in Ohio earn 55 cents for every dollar earned by men, while nationally, working women earn 62 cents for every dollar earned by men.³

Another statistic important to the evaluation of Ohio's economy is the population level of educational attainment. The 1980 census shows that Ohio, with 67% of its adult population having completed high school, has performed a little above average (66.5%) in raising the level of mass education, reflecting its slightly above average income. But a parity level of income is apparently not a sufficient condition for achieving an average level of college graduates among the resident population, that most mobile segment of the labor force. Ohio, with 13.7% college graduates, falls far short of the national average figure of 16.2% (see Figure 1).

A draft study by Dr. Mark Salling of Cleveland State University reveals that 37% of Ohio's out-migrants are college graduates.⁴ Almost half of those have moved to Southern or Pacific states (see Figure 2). More than any other single factor, the technological maturity and economic stagnation of the Ohio economy prompted the heavy net out-migration of college graduates, both by dampening interest and excitement in the kinds of work to be done here and slowing the promotion of this upward-bound population.

The role of higher education in providing research and development is of significance to state economic development.⁵ The R&D function of universities is a critical element in establishing new businesses and promoting the development of new products. R&D also attracts new industries to an area, thereby providing for job creation, primarily in the "high technology" businesses.

Figure 1

EDUCATION LEVEL

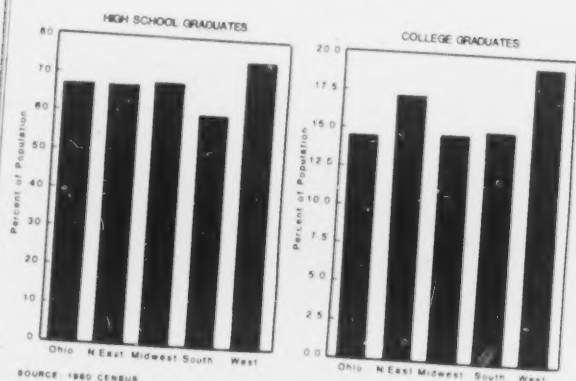


Figure 2

MIGRATION OF OHIO'S COLLEGE EDUCATED

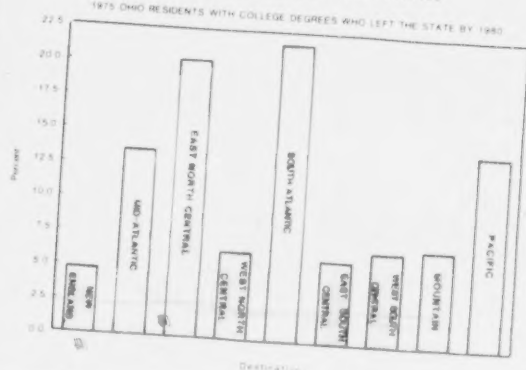
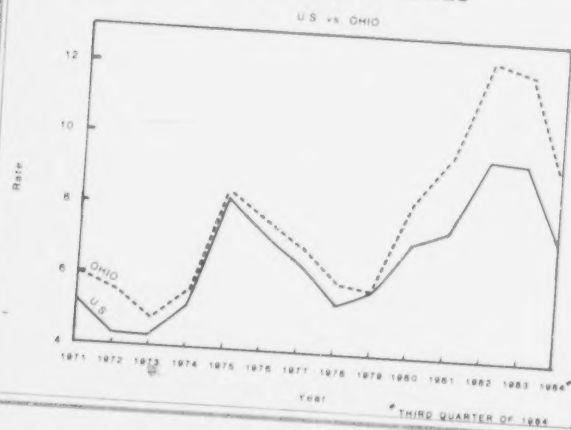


Figure 3

UNEMPLOYMENT RATES



As a recipient of federal R&D funds, Ohio does comparatively poorly. According to National Science Foundation records for fiscal year 1981 (survey by *The Chronicle of Higher Education*), \$4.4 billion was provided in federal obligations to 100 higher education institutions throughout the nation. Ohio receipts were only \$110 million, or 2.5% of the total distribution. Funding from state and local governments, as well as industrial sources, has also been relatively low.

Traditionally, Ohio has had a lower unemployment rate than the nation, but since 1979, it has been higher. Figure 3 shows the nonagricultural unemployment rates for Ohio and the U.S. from 1970 through the third quarter of 1984.

This new pattern in the unemployment rate becomes significant when considering the other changes in the state and national economies. A study examining the six business cycles since 1945 showed a tendency for greater deviation in the Ohio economy than in the national economy.⁶ After each downturn in the business cycle, Ohio's economy has not rebounded to previous levels, lagging the national recovery pattern.

Another economic problem is that the state is perceived to have a poor business climate. Utilizing factors such as the level of unemployment compensation benefits, the cost of employee benefits and wages, work stoppages, and tax structure, the Alexander Grant Company ranks the states each year. In the 1984 study (based on 1983 information) Ohio came out second to last as a place to do business. Ohio is downgraded more by its high wages and benefits and the effects of unionization than by its tax structures.

Given Ohio's poor business climate, it is not surprising that corporations in Ohio had less profits. In 1979 Ohio corporate tax receipts (a reflection of corporate profits) grew by 9.1% over 1978, while national profits increased by 15.9%, in 1980 the gap between the two grew wider, with national tax receipts growing by 14.3% and Ohio's by only 3.0%, and in 1981 Ohio receipts actually declined by 12.2%, when national profits decreased by only 3.8%.

An analysis of economic factors such as those described above was prepared by the United States Department of Commerce. If present trends continue (and that is an important "if"), the prediction is that Ohio's growth rate will be half that of the national average throughout the remainder of this century, with only Cincinnati and Columbus faring slightly better than the national average.

While the nation ended 1984 with about 10% more jobs than there were in 1978, Ohio had about 3.5% fewer. The study implies that Ohio's economic problems are structural rather than cyclical and the changes in the nature of its economy that have already taken place in the past two decades are likely to continue in the next two.

Within the context of this overview of the economy of Ohio, it is useful to consider two specific factors as they



help to explain the nature of the economic changes underway in the state. They are:

1. The relationship between the service and manufacturing sectors of employment in Ohio and other parts of the country, and compared to that in other states, regions, and the nation.
2. The growth or decline of "hi-tech" industries and "smokestack" industries in the state compared to other parts of the country.

Changes in Manufacturing and Service Sector Jobs

One of the major effects of the recession was the continuation of the long-term trend away from manufacturing-sector jobs toward service jobs. The accompanying tables and graphs show how it has hit Ohio compared to other parts of the nation and what the implications of this trend may be.

Nationwide, from 1978-1983, 9.1% of all manufacturing jobs were lost while employment in the services increased by 17.6%. In fact, in 1982, for the first time in history, more people were employed in the services (21.8%) than in manufacturing (20.5%).

The Midwest followed the national trend, but at much different magnitudes. In Ohio, the loss in manufacturing employment was 26.3% and the gain in service employment was only 13.6%, an overall net loss in total employment of 6.8%. This pattern was true in other Midwestern states, but not in other regions of the country (see Table 1).

The bright spot here, if there is one, is that Ohio suffered almost three times the national rate of decline in manufacturing jobs but still managed to achieve almost two-thirds of the national rate of growth in service work. This suggests that the strong trend to services overwhelmed the normal association between (export) manufacturing and (local-market-oriented) services, assumed to dominate their relationship in the conventional local multiplier theory. Either services are becoming more oriented to markets outside the local economy — "basic" in their own right — or local economies are becoming more self-sufficient through "import substitution growth" in services. We have not yet come to appreciate that the much heralded shift from goods to services — the "post-industrial age" — probably implies greater internalization of the local economy, at least in the larger ones. And an important corollary of this hypothesis is that (large) local economies simply may not need to find a new export job for each one lost, if they succeed in developing new service functions in their own local market, thereby retaining local dollars previously spent outside, whether for goods or services.

Table 1
Percent Changes in Employment
1978 - 1983

	Manufacturing Employment	Service Employment	TOTAL Employment
OHIO	(26.3%)	13.6%	(6.8%)
Midwest ¹	(22.1)	11.8	(6.8)
So. Central ²	(6.9)	25.0	8.5
West ³	1.9	20.7	8.0
U.S.	(9.1)	17.6	5.1

¹ Ohio, Indiana, Illinois, Michigan, Wisconsin, Pennsylvania

² Alabama, Tennessee, Mississippi, Kentucky, Texas,

Arkansas, Louisiana, Oklahoma

³ All states south of the Dakotas and West of the Rockies.

Table 2
Percent of Total Employment
Manufacturing & Service

	Manufacturing		Service	
	1978	1983	1978	1983
OHIO	31.5%	26.1%	17.6%	21.4%
Midwest	30.1	25.2	17.7	21.6
So. Central	22.0	18.9	16.1	18.6
West	17.8	16.8	20.6	23.0
U.S.	23.7	20.5	18.6	21.8

Table 3
Average Weekly Earnings in Ohio
Service and Manufacturing Sectors¹

	Manufacturing	Service	Service as a % of Manufacturing
1978	\$319	\$183	57.4%
1979	347	201	57.9
1980	378	220	58.2
1981	415	243	58.6
1982	439	263	59.9
1983	465	276	59.4

¹ Based on Payrolls Covered by Worker's Compensation.



How well differing areas of the country have diversified between service and manufacturing employment has varied widely (see Table 2 and Figures 4-5). While more people are now employed in services than in manufacturing nationwide, the Midwest still has 725,000 more people employed in manufacturing than in services.

The effects of this structural change in the economy on state and local budgets becomes evident when one looks at comparative earnings in these two sectors. In Ohio, based on payrolls covered under worker's compensation, average weekly earnings in services is about 60% of those in manufacturing (see Table 3). Thus, the continued move toward service jobs and away from manufacturing jobs will significantly curtail growth in personal income throughout Ohio and the Midwest. This, in turn, will reduce taxable income (the source of payroll tax revenues) and disposable income (a key ingredient in retail sales and, thus, sales tax receipts).

Figure 4

SERVICE EMPLOYMENT

AS A PERCENT OF TOTAL EMPLOYMENT

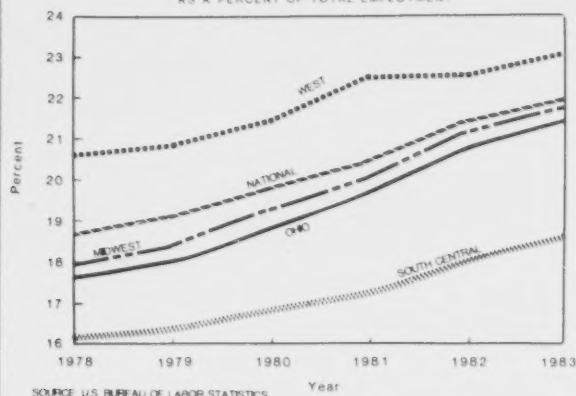
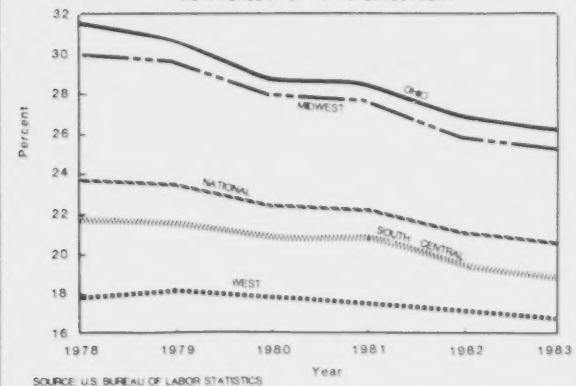


Figure 5

MANUFACTURING EMPLOYMENT

AS A PERCENT OF TOTAL EMPLOYMENT



Given this continued trend, local governments will not be able to count on traditional growth rates in tax receipts over time. In addition, a new recession in the next couple of years would probably cause this structural change again to accelerate, further dampening long-term personal income growth in the region.

But still, there may be a slender ray of hope in Table 3, in the rising rate of service pay relative to manufacturing. Between 1978 and 1983 service average weekly earnings in Ohio rose from 57.4 to 59.4% of the manufacturing level, or roughly one half percentage point per year. At this rate, service pay could attain between two-thirds and three-quarters of the manufacturing level by the year 2000. If there is good reason to believe that Ohio has lagged in capturing the better service work and under today's stern challenge will catch up, the upper end of this range might prove to be the better forecast.

Further, when one recalls that manufacturing jobs and wage rates are subject to much more intense competition from low-wage countries, while service work is more protected by the naturally higher transportation costs of person movement, a case can be made that service pay may catch manufacturing pay by the turn of the century.

Smokestacks vs. High Tech

The transition from the traditional "smokestack" industries to the new "high technology" industries has attracted much public attention. There has been some concern that Ohio is lagging behind the nation in high tech development. Table 4 lists eleven industry categories characterized as high technology by the Bureau of Industrial Economics.⁸ Five industry categories judgmentally selected as "smokestack" industries are also listed. The number of persons employed in each industry for years 1978 through 1982, compiled by the Bureau of the Census, is reported in the adjacent columns. In some cases estimates are used because of suppression of data by the Census Bureau.

After a decline during the recession of the mid-1970s, employment in high technology industries peaked in 1979 with 62,554 workers in Ohio. A slow, but steady, decline followed. In the period between 1978 and 1982, only in the categories of "Medical Instruments and Supplies" and "X-Ray Apparatus and Tubes" did a substantial increase in employment occur, up to 13% and 6%, respectively. However, the two largest categories, "Communication and Equipment" and "Measuring and Control Devices," experienced declines of 18% and 16%, respectively.

The smokestack industries also reached a peak in 1979, followed by a sharp decline. The most serious losses were in the primary metals industry, which lost 42,331 employees, and the motor vehicle industry, which was down 42,859 employees. The "tire and innertube" category lost 15,778 employees, or 80% of its 1978 total.



Figure 6 shows the percent change in employment from the base year of 1978. The smokestack industries had a sharp decline, down 29.3%, while employment in high technology industries fell 4.7% in the same five-year period.

Figure 7 shows that the Ohio pattern (described above) is not unusual for a midwestern industrial state. Similar patterns appeared in Pennsylvania, Illinois and probably Michigan. (The smokestack industry employment could not be calculated for Michigan because of constant suppression of the very significant motor vehicle category in that state.) However, the disturbing element here is that high technology industry experiences a substantial growth nationwide.

Table 4
Employment For Selected High Technology and Smokestack Industries in Ohio, 1978 to 1982

High Technology Industries	1978	1979	1980	1981	1982
Plastic Material and Synthetics	5,799	5,219*	4,639	3,921	4,527
Drugs	3,205	2,992	3,076	3,231	3,369
Office and Computing Equipment	5,382	6,601	6,654	6,201	5,467
Communications Equipment	10,661	11,837	11,457	10,285	8,701
Electronic Components and Acces.	8,070	8,705	9,045	8,065	8,892
Engineering and Scientific Instru.	1,271	1,436	1,551	1,656	1,456
Measuring and Control Devices	16,033	15,926	14,867	14,325	13,392
Medical Instruments and Supplies	4,566	4,634	4,887	4,999*	5,172
X-Ray Apparatus and Tubes	3,291	3,547	3,442	3,477	4,468
Optical Instruments and Lenses	1,181*	1,419	1,498*	1,578	1,224
Photographic Equipment and Supplies	731*	818	714	691	704
TOTAL	60,190	62,554	61,830	58,459	57,372
Smokestack Industries	1978	1979	1980	1981	1982
Tires and Innertubes	19,788	16,896	8,631	5,847	4,010
Primary Metal Industry	149,653	148,712	136,182	126,722	107,322
Farm Machinery and Equipment	3,586	3,136	3,499	3,022	2,127
Metalworking Machinery	50,313	53,415	54,880	51,877	47,851
Motor Vehicles and Equipment	126,459	135,160	104,326	97,047	83,600
Metal Forgings and Stampings	53,638	56,335	48,873	45,460	40,477
TOTAL	403,437	413,654	356,391	329,975	285,417

* Indicates estimates.

Source: U.S. Bureau of the Census, County Business Patterns, Ohio, 1977 - 1982.

Figure 6

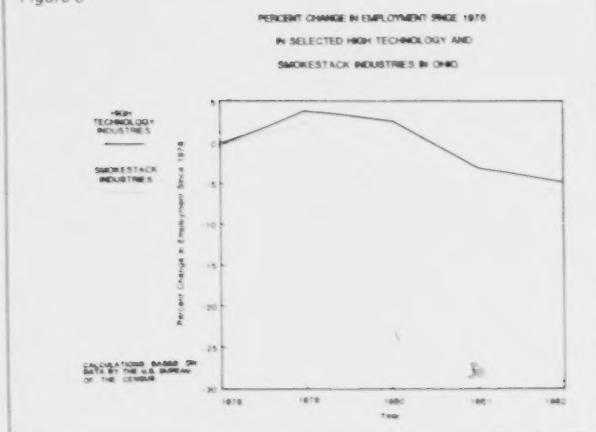


Figure 7

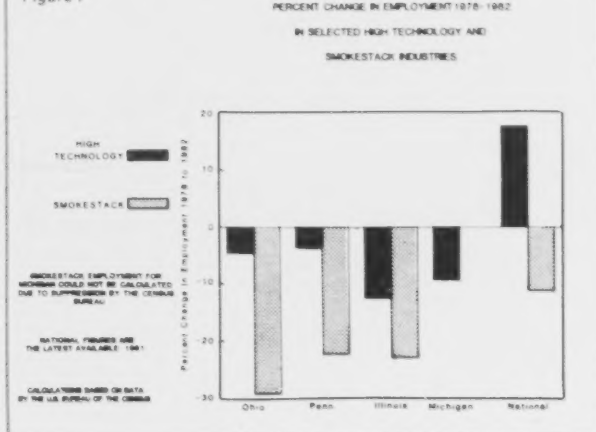


Figure 8

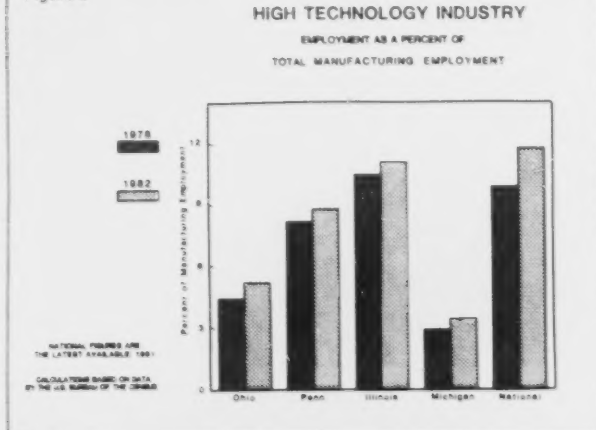




Figure 8 shows that employment in high technology industries makes up a relatively small percentage of the manufacturing employment totals in Ohio and Michigan. Pennsylvania and Illinois are much closer to the national average. Although this percentage increased in all four states during the five year period, this apparent growth was due more to the decline of other industries, such as the smokestack industries, than to the vigor of Midwestern high-tech activity.

The data seem to say that Ohio has experienced a double crisis. The effects of the declining smokestack industry are well recognized. However, the small size and lack of growth in the high technology industries may foreshadow further economic problems for Ohio as the twentieth century draws to a close.

Conclusion

This article only begins to discuss some of the important considerations vital to public and private policy making. For those concerned with the allocation of public financial resources, long-range thinking and planning in the light of the economic environment is essential. In the short run it is also useful in that it will help to explain why revenues are not coming into the treasury as planned or expected and why certain kinds of expenditures are increasing. In brief, then, it is hoped that more research and analysis into the various characteristics influencing Ohio's economy will be undertaken so that those concerned about planning the future will have a clearer sense of direction.

Notes

¹ Data used in this section are compiled from various reports of the U.S. Bureau of the Census, the Data User Center of the State Department of Development, the state Bureau of Employment Services, and the U.S. Bureau of Labor Statistics. Specific references to each statistic are omitted to facilitate readability.

² Data about the shifts in Ohio's population are taken from John J. Gargan, Department of Political Science, Kent State University, unpublished paper, "Urban Revitalization and Vitalization, Testing Ohio's State and Local Government Capacity," December 1982. The paper is an excellent study of the factors contributing to economic decline in Ohio and also makes the case for state and local government cooperation to achieve urban revitalization and vitalization.

³ Robert J. Van Der Velde, "The Female Income Gap: Preliminary Observations," Cleveland State University, The Northern Ohio Data and Information Service, December 1983.

⁴ Mark Salling, "Draft Mobility Study," Cleveland State University, College of Urban Affairs, unpublished working paper, November 1984.

⁵ Richard G. Sheridan, "Ohio Tomorrow: State Economic Growth and Development and the Role of Higher Education," Cleveland State University, College of Urban Affairs, n.d.

⁶ Robert F. Premus, "The Long Run Growth and Cyclical Stability of Ohio's Economy," Wright State University, Department of Economics, unpublished paper, 1981.

⁷ Ohio Legislative Budget Office, "The Regional Nature of the Recession," Columbus, 1982.

⁸ U.S. Department of Commerce, "1984 U.S. Industrial Outlook," Washington, D.C., January 1984.



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By Richard G. Sheridan

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About the Author

Richard G. Sheridan is an Urban Scholar in the College of Urban Affairs and a faculty member in the Department of Urban Studies at Cleveland State University. From 1973 until his appointment at CSU in 1982, he directed the Ohio Legislative Budget Office.

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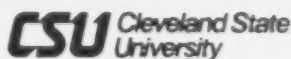
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Ohio Economic Trends Review publishes articles about current public finance and economic development issues of interest to state and local government policymakers and administrators, scholars, students, and individuals who monitor and state's economic and financial condition for the private sector.

Ohio Economic Trends Review is produced by the Fiscal Futures Service of the Cleveland State University College of Urban Affairs and is edited by the Ohio Public Finance Roundtable and Board of Editors. Views expressed in articles are those of the authors and do not necessarily reflect official positions of the Fiscal Futures Service.

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The Urban Center at Cleveland State University, of which the Fiscal Futures Service is a part, was created as a model for university and community linkage efforts. The seven other Ohio urban universities participating in the Urban University Program include the University of Akron, the University of Cincinnati, Kent State University, The Ohio State University, the University of Toledo, Wright State University, and Youngstown State University.

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"The articles are written for noneconomists as well as economists."

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With this winter issue, the review is beginning regular publication. If you have not subscribed to date, a subscription card is attached to this issue for your convenience.





Ohio Economic Trends Review

Contents

Winter 1986
Volume 1, Number 2

Long-run Growth and Cyclical Behavior of Ohio's Economy/6

Analysis of the performance of the state's economy since World War II shows that Ohio has separated from national economic trends and suffers more in recessions and benefits less and later in recoveries than the nation as a whole. The explanation rests largely with the importance of manufacturing to the state. More activity by high-technology and service industries could bring the Ohio economy into rhythm with the national economy.

Transformation of the Akron Economy/14

The Rubber City is no longer just a working class town. The decline in the number of manufacturing jobs linked to the rubber industry has been followed by growth in nonmanufacturing, service-oriented jobs ranging from corporate administration to research and development and restaurants. The rubber industry also developed a network of industries poised to participate in the growth of polymer production. The changes bring Akron closer in tune with the national economy. This is the first in a series of profiles of Ohio's major metropolitan areas in *Ohio Economic Trends Review*.

Ohio Regional Forecasts for 1986/22

In Ohio in 1986 there actually will be eight separate regional economic outlooks for the coming year. Economists from around the state, mostly from major universities, have prepared local forecasts for seven of those metropolitan areas.

Econometric Model Generates 1986 Leading Indicator Forecasts for Ohio SMSAs/27

What's ahead in 1986? The econometric forecasting model unveiled in the premier issue of *Ohio Economic Trends Review* has been used to produce forecasts of 1986 leading indicators in eight Ohio Standard Metropolitan Statistical Areas. New data has been added to refine the forecasts. The outlook is optimistic for employment and payrolls, but retail sales may slip by year's end.

Viewpoint: Interstate Tax Competition and Economic Development/37

Interstate competition to offer incentives for economic development is putting pressure on safety net programs at the state level and making states reluctant to resolve tax equity issues. Viewpoint is a guest column.



Long-Run Growth and Cyclical Behavior of Ohio's Economy

By Robert Premus*

I. Introduction

Fiscal officers and budget analysts, at the state and local government levels, must contemplate changes in Ohio's economy to project the revenue yield from their respective tax structures. Since the national economy is a primary determinant of economic conditions in state and local economies, an understanding of how Ohio's economy performs relative to the national economy is of paramount importance. Also of importance is the fiscal analyst's ability to perceive changes in national economic conditions.

Economic forecasters in industry and policy analysts in government, who are concerned about investment opportunities in Ohio, also need to be cognizant of Ohio's long-run trends and cyclical performance. Ohio's industrial mix, its overall climate for entrepreneurship and innovation, and the quality of human capital are major determinants of Ohio's long-run and cyclical performance.

This paper examines Ohio's overall growth performance from 1952 to the present. The sensitivity of Ohio's economy to national recessions and recoveries is discussed. Ohio's economy benefits less than the nation from economic recovery and it is hurt more than the nation by recessions. This finding of the study is true to an even greater extent for the manufacturing sector. In fact, Ohio's manufacturing sector accounts for much of the cyclical variation in Ohio's overall economic performance. The result is a high degree of business uncertainty in Ohio, creating a potentially significant barrier to investment, entrepreneurship, and innovation.

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The paper concludes that Ohio needs to diversify into the high-tech and service industries to offset the destabilizing influence of traditional manufacturing. Since Ohio cannot control national business cycles, incentives for economic diversification must come from internal improvements in Ohio's overall climate for entrepreneurship and innovation. A vibrant entrepreneurial community is particularly important to Ohio since the state needs to spawn new industries to offset job losses in the traditional manufacturing sectors. The poor long-run performance of Ohio's economy suggests that the nation's business community perceives investment opportunities in Ohio to be significantly less attractive than in other states and regions. One consequence is that the new high-tech and high-growth service sectors are noticeably underrepresented in Ohio's industrial mix.

The economic indicators used to measure Ohio's overall long-run and cyclical performance are total nonagricultural employment and the unemployment rate. Labor market indicators are used to measure aggregate performance since reliable data on gross state product are not available.

II. Long-Run Trends

Ohio's economy is not expanding as rapidly as the U.S. economy. According to Table 1, over the 1952-1980 period, Ohio's total nonagricultural employment grew by 46 percent from 3.01 million to 4.37 million. U.S. nonagricultural employment grew by 86 percent over this period from 48.78 million to 90.41 million. The significantly slower long-term secular growth of the Ohio economy can be observed in Figure 1 as the difference in the slopes of the regression lines superimposed on U.S. and Ohio employment data. The slope parameter (0.5) for the Ohio regression line is less than the slope parameter (1.5) for the U.S. regression line. Both regression lines express nonagricultural employment as a function of TIME, indicating that Ohio's long-term employment growth, although large in an



absolute sense, is not keeping pace with national growth.

1960-1979: A significant increase in job growth occurred after 1960. In particular, the post-1960 period saw an acceleration over the 1952-1960 period in the growth of total nonagricultural employment in the U.S. and Ohio economies, but relative growth was faster in the U.S. economy. Nonagricultural employment increased at an average annual rate of 3.3 percent nationally and at an average annual rate of 2.2 percent for Ohio. In contrast, over the 1952-60 period, average annual growth rate for the U.S. and Ohio economies was 1.4 percent and 0.6 percent, respectively. On the positive side, Ohio's growth rate increased after 1960 by more than the national growth rate, thus reducing somewhat the rate by which Ohio's nonagricultural employment growth was lagging U.S. non-agricultural employment growth.

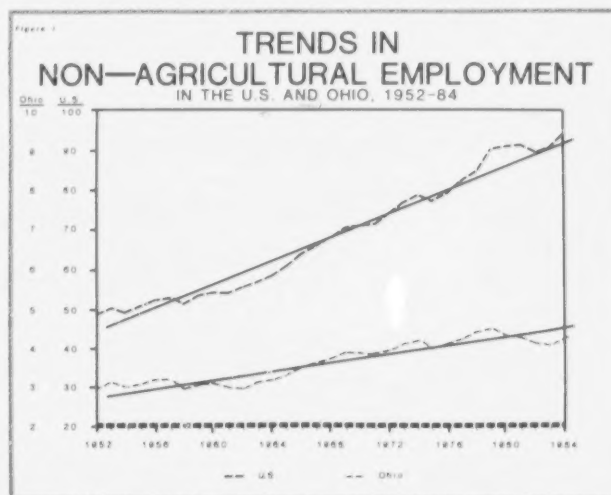
What accounts for the sharp acceleration in nonagricultural employment growth during the post-1960 period? Naturally, employment demand had to be increasing, but the primary factor was an acceleration in the rate of growth of labor supply. The post World War II "baby boom," the largest in U.S. history, turned into a "labor force boom" in the 1960's and 1970's. The rapid increase in the labor supply kept real wages from rising at the rate they would have experienced in the absence of the unusual outward shift in labor supply. The unemployment rate experienced an upward secular trend over the period and inflation began to accelerate. Relatively high unemployment and inflation, by moderating the rate of increase in real wages, lowered the rate of return on labor-saving capital investments. The business community responded by substituting more labor-intensive production techniques for capital-intensive production techniques. Thus, employment demand increased over the period even though the capital formation rate remained steady. Growth in the nation's capital/labor ratio fell sharply as did the rate of increase in labor productivity.¹

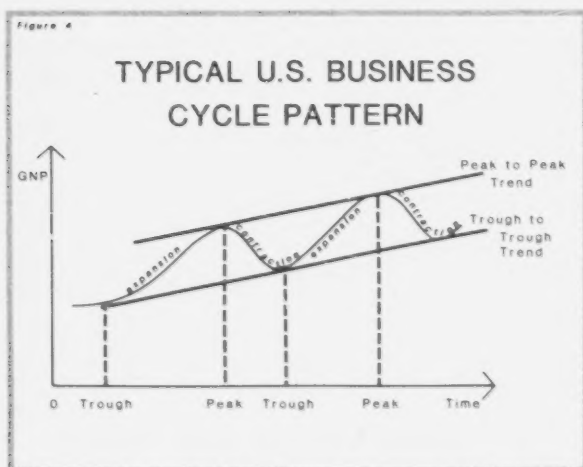
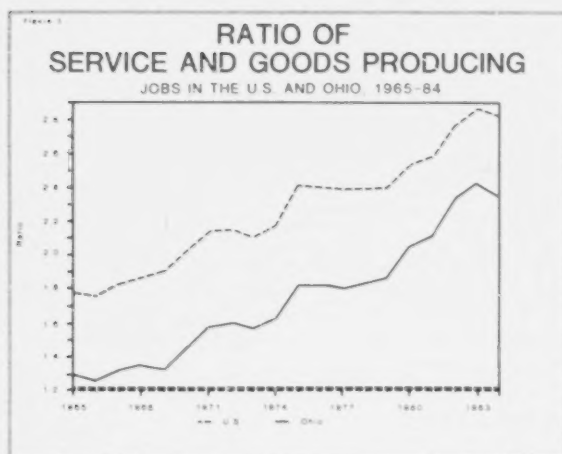
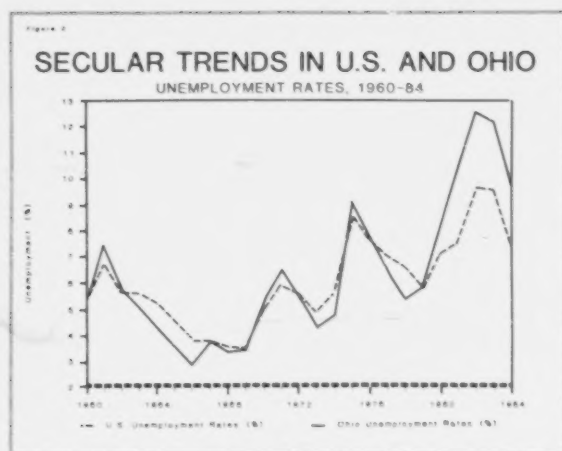
The decline in labor productivity was viewed with alarm by many economists, businessmen and social commentators, but this may be a wrong perspective. An acceleration in the rate of capital formation in the 1960's and 1970's would have significantly reduced growth in labor demand and resulted in intolerably high rates of unemployment. An analysis of labor demographics over the period suggests that slower growth in the capital/labor ratio was a natural market response to an increasing supply of labor to the economy.² The result was an accelerated increase in the demand for labor (because of moderation in real wage rate increases) which moderated the secular increase in the

Table 1
Nonagricultural Employment and
Unemployment in United States and Ohio,
1952-1984

Year	Employment (thousands)		Unemployment (thousands)	
	U.S.	Ohio	U.S.	Ohio
1952	48,781	3,005	30	
1953	50,213	3,150	29	
1954	48,989	3,028	56	
1955	50,637	3,129	44	
1956	52,385	3,220	41	
1957	52,878	3,230	43	
1958	51,337	3,007	68	
1959	53,287	3,112	54	
1960	54,212	3,147	55	53
1961	54,023	3,044	67	74
1962	55,578	3,099	56	57
1963	56,624	3,145	56	51
1964	58,313	3,216	52	43
1965	60,799	3,364	45	36
1966	63,931	3,537	38	29
1967	65,840	3,620	38	38
1968	67,942	3,751	36	34
1969	70,432	3,887	35	35
1970	70,921	3,881	50	53
1971	71,216	3,839	60	65
1972	73,703	3,938	56	55
1973	76,889	4,113	49	43
1974	78,419	4,170	56	48
1975	77,049	4,009	85	91
1976	79,445	4,094	77	78
1977	82,129	4,215	71	65
1978	84,560	4,380	66	54
1979	89,823	4,485	58	59
1980	90,406	4,367	71	81
1981	91,156	4,318	76	104
1982	89,566	4,124	97	125
1983	90,196	4,092	96	122
1984	94,461	4,248	75	96

Source: "Employment and Earnings," U.S. Department of Labor, Various issues 1952-1978





unemployment rate.

The percent of young people, women and minorities in the labor force rose sharply in the 1960's and 1970's. Bringing these people into the mainstream of American economic life was a major social accomplishment, often overshadowed in public discussions because of concern over the secular rise in the unemployment rate. These demographic groups are typically the last hired and the first fired when economic conditions change. They also tend to voluntarily enter and leave the labor force more frequently than their older, more experienced counterparts. As a result, the nation and Ohio experienced secular growth in their unemployment rates at a time when job growth was accelerating.³

Since the Ohio economy was subjected to the same demographic trends as the nation, it was the failure of Ohio's economy to create employment growth (demand) at the national rate that resulted in a larger upward secular rise in Ohio's unemployment rate. Figure 2 presents the upward secular trends in Ohio's and the nation's unemployment rates.

Structural Changes: Labor demand also rose due to an increase in the demand for goods and services. Consumer demand rose because of a larger population and higher family incomes caused by an increasing proportion of the population in the labor market. Growth in demand for products and services increased at about the same rates, but service productivity growth lagged manufacturing productivity growth. Thus, labor demand in the service industries increased relative to labor demand in the goods producing industries.

Table 2 and Figure 3 show jobs in the service producing sectors relative to jobs in the goods producing sectors for Ohio and the U.S. In 1984, Ohio had 2.4 jobs in its service sectors for each job in the goods producing sectors, up from a 1.3:1 ratio in 1965. The ratio for the U.S. was 2.8:1 in 1984 and 1.8:1 in 1965. Apparently, Ohio is slightly more dependent upon its goods producing sectors for jobs and growth than the national economy.

Of interest to Ohioans is the gradual tendency of the state's industrial structure to converge to the nation's industrial structure. This convergence is occurring because job growth in Ohio's service sector lags U.S. service sector job growth by less than Ohio's manufacturing sector lags U.S. manufacturing job growth. The convergence in economic structure should not be interpreted to indicate that Ohio is becoming more structurally diversified. The central problem is that Ohio lacks dynamism in both its service and manufacturing sectors. As discussed in the premier issue of this journal, a major deficiency in Ohio's industrial



structure is an underrepresentation of high growth service and high-tech manufacturing firms.⁴

III. Short-Run Cyclical Patterns

This section examines patterns of variation in employment and unemployment in the Ohio economy over the seven business cycles that have occurred since 1953. A business cycle is characterized by short-run movements in general economic conditions over three successive phases: contraction, expansion and contraction. Figure 4 presents the general business cycle pattern for illustrative purposes.

The strategy in this section is to measure cyclical contractions in the Ohio and U.S. economies by the percentage decline in nonagriculture employment from peak to trough for each business cycle in the post-war period. Trough to peak percentage changes are also calculated for each expansion phase of the business cycles. The percentage change in employment from peak to peak, and from trough to trough, for each successive business cycle is also calculated and presented. Of importance to Ohioans is the degree to which the Ohio economy responds to national business cycles, the relationship between short-run business cycles and long-term economic growth, and the policy options available to state decision makers.

In general, it was found that the Ohio economy experiences greater cyclical variations than the U.S. economy, and Ohio's cyclical variations show a tendency to increase over time. Moreover, the post-1970 Ohio economy may have entered into a new phase of economic development characterized by even greater cyclical variability, and a widening of the growth gap between the Ohio economy and the national economy. In fact the analysis of this section suggests that the wider cyclical swings in Ohio's economy, by having a dampening effect on business investment, actually contribute to Ohio's lackluster long-term performance.

Employment Cycles: Seven cycle expansions and contractions in nonagricultural employment are analyzed in this section. The cycle turning point dates used in the analysis are presented in Table 3. They were obtained from the U.S. Reference Cycle, published by the National Bureau of Economic Research in various issues of the *Business Conditions Digest*.

Table 4 summarizes the data on trough to peak (expansions) changes in nonagricultural employment in the Ohio economy over the 1954-80 period. During the seven expansions, the mean trough to peak percentage change was less for Ohio (8.0 percent) than for the U.S. economy (10.8 percent). In comparison to Ohio, after 1953, the

Table 2
Trends in Goods Producing and Service Producing Sector Jobs, 1965-84

Year	U.S.			Ohio		
	Goods Producing (1)	Service Producing (2)	Ratio (2/1)	Goods Producing (3)	Service Producing (4)	Ratio (4/1)
1965	21880	38936	1.8	1462	1894	1.3
1966	23116	40839	1.8	1481	1875	1.3
1967	23268	42589	1.8	1524	2009	1.3
1968	23672	44244	1.9	1597	2157	1.4
1969	24221	46063	1.9	1668	2223	1.3
1970	23352	47242	2.0	1574	2307	1.5
1971	22542	48103	2.1	1489	2351	1.6
1972	23061	49704	2.2	1512	2426	1.6
1973	24720	52113	2.1	1602	2511	1.6
1974	24697	53715	2.2	1589	2581	1.6
1975	22603	54448	2.4	1422	2594	1.8
1976	23332	56111	2.4	1450	2645	1.8
1977	24229	57912	2.4	1507	2723	1.8
1978	25585	61113	2.4	1554	2841	1.8
1979	26461	63363	2.4	1565	2920	1.9
1980	25658	64748	2.5	1432	2936	2.1
1981	25497	65659	2.6	1386	2931	2.1
1982	23813	65753	2.8	1235	2890	2.3
1983	23334	66862	2.9	1197	2895	2.4
1984	24730	69731	2.8	1268	2980	2.4

Table 3
U.S. Business Cycle Dates for Peaks and Troughs Since 1945

Peak		Troughs	
Feb.	1945	Oct.	1945
Nov.	1948	Oct.	1949
Jul.	1953	May	1954
Aug.	1957	Apr.	1958
Apr.	1960	Feb.	1961
Dec.	1969	Nov.	1970
Nov.	1973	Mar.	1975
Jan.	1980	Jul.	1980
Jul.	1981	Nov.	1982

Source: U.S. Reference Cycle, "Business Conditions Digest", 1977 and 1984.

expansion phases of the U.S. Reference Cycles generated significantly higher percentage growth in employment for the U.S. economy. On the down side of business cycles, Ohio's relative economic performance was even worse. The mean percentage peak to trough change in nonagricultural employment during the seven cyclical contractions for Ohio (3.5 percent) was substantially greater than for the U.S. economy (1.3 percent) (Table 5). Thus, in general, it would appear that the Ohio economy suffers more than the national economy during recessions and it benefits less than the national economy during expansions.

Peak to peak and trough to trough changes in



Table 4
Change in U.S. and Ohio Nonagricultural
Employment During the Expansion Phase
of the U.S. Reference Cycle, 1954-84

Trough	Peak	Increase (%)	
		U.S.	Ohio
1954	- 1957	7.9	6.7
1958	- 1960	5.6	4.7
1961	- 1969	30.4	27.7
1970	- 1973	8.4	6.0
1975	- 1980	17.3	8.7
1980	- 1981	0.8	-1.1
1982	- 1984	5.5	3.0
Mean of increases		10.8	8.0

Table 5
Change in U.S. and Ohio Nonagricultural
Employment During the Contraction Phase
of Business Cycle, 1953-82

Peak	Trough	Decrease (%)	
		U.S.	Ohio
1953	- 1954	-2.4	-3.9
1957	- 1958	-2.9	-6.9
1960	- 1961	-0.3	-3.3
1969	- 1970	0.7	-0.2
1973	- 1975	0.2	-2.4
1981	- 1982	-1.7	-4.5
Mean of decreases		-1.3	-3.5

Table 6
Peak to Peak and Trough to Trough Percent
Change in the U.S. and Ohio Non-
agricultural Employment, 1953-1984

Peak to Peak	U.S.		Trough to Trough	U.S.	
	U.S.	Ohio		U.S.	Ohio
1953-1957	5.3%	2.5%	1954-1958	4.8%	0.7%
1957-1960	2.5	-2.6	1958-1961	5.2	1.2
1960-1969	30.0	23.5	1961-1970	31.3	27.5
1969-1973	9.2	5.8	1970-1975	8.6	3.5
1973-1980	17.6	6.2	1975-1980	17.3	8.7
1980-1981	0.8	-1.1	1980-1982	-1.0	-5.6
Mean	10.8%	5.7%		11%	6%

¹Calculated from Table 1 using Reference cycle turning points in Table 5. Average annual employment data are used in the calculation for the year in which business cycle peaks and troughs are dated.

nonagricultural employment can be used to indicate long-run growth trends and trends in the degree of cyclical variability of the economy. Table 6, which displays the mean value of peak to peak percentage changes in nonagricultural employment for the Ohio and the U.S. economies, suggests that the long-term growth potential of Ohio's economy lags the U.S. economy. The mean values for peak to peak percentage changes in nonagricultural employment for the Ohio and the U.S. economies are 5.7 percent and 10.8 percent, respectively. Mean trough to trough percentage increases, also presented in Table 6, were, on average, greater for the U.S. economy than for the Ohio economy. In fact, on the average, peak to peak and trough to trough percentage growth for the U.S. economy were the same. This suggests that the magnitude of contractions and expansions has not widened over time for the U.S. economy. In contrast, peak to peak growth in Ohio was slightly less than trough to trough growth in Ohio. Thus, it would appear that Ohio's cyclical employment variations have been increasing over time.

Unemployment: Changes in employment growth (or labor demand) should be reflected in cyclical changes in the unemployment rate, since labor supply is not likely to be significantly affected by product-oriented changes in labor demand. This is precisely the relationship between employment changes and unemployment that exists for the U.S. and Ohio economies, although some significant differences exist.

Both the Ohio and the U.S. economies display similar cyclical variations in unemployment. However, Ohio labor markets are more sensitive to changes in national economic conditions (See Table 1 and Figure 2). From a high of 7.4 percent in 1961, Ohio's unemployment rate fell steadily to a low of 2.9 percent in 1966, a drop of 60.9 percent. Over the same period, the U.S. unemployment rate fell 43.3 percent from 6.7 percent to 3.8 percent. But by 1971, Ohio's unemployment rate (6.7 percent) was again above the U.S. unemployment rate of 6.6 percent. In 1974, Ohio's unemployment rate (4.8 percent) again plunged below the U.S. unemployment rate (5.6 percent). The recession which followed and bottomed out in 1975 resulted in Ohio's unemployment rate soaring to 9.1 percent, well above the national rate of 8.5 percent. By 1978, Ohio's unemployment rate (5.4 percent) again fell below the U.S. unemployment rate (6.0 percent). The slowdown in economic growth after 1979 and the recession in 1980 characteristically found Ohio's 1980 unemployment rate (8.1 percent) rising above the national unemployment rate (7.1 percent) by 1980. Thus, throughout the 1960's and 1970's, national business cycles were considerably more



destabilizing to Ohio's labor markets.

Greater uncertainty in Ohio's labor markets can add to the cost of doing business in Ohio. First, Ohio firms must offer wage premiums to prevent skilled labor from migrating to regions where labor market opportunities are more secure. Second, changes in the unemployment rate trigger increases in welfare-related programs. Higher state transfer payments lead to a reduction in other expenditures or high taxes. Because these negative feed-back effects detract from the attractiveness of the state's overall investment climate, the short-run cyclical behavior and long-run performance of Ohio's economy are not independent. The likely effect of increased business uncertainty is a less dynamic economy and a lower rate of new investment.

IV. Cycle Turning Points

An inspection of Table 1 and Figure 1 (presented earlier) will reveal that the turning points of the expansion and contraction phases of Ohio and U.S. total nonagricultural employment cycles are roughly coincident, when using annual data. There are two important exceptions. First, the recovery phase of the 1975 recession found Ohio nonagricultural employment growth lagging recovery in U.S. nonagricultural employment growth by a full year. The percentage growth in Ohio nonagricultural employment from 1975 to 1976 was 2.1 percent as compared to 3.1 percent for the U.S. economy. However, after the delay, the Ohio economy responded with resiliency. Nonagricultural employment growth from 1976 to 1978 for Ohio (7.0 percent) was greater than it was for the U.S. economy (6.4 percent) by a margin greater than might be expected from historical trends. Also, Ohio employment continued to expand through 1979, increasing by about 2.4 percent.

Table 7
Percent Change in U.S. and Ohio
Manufacturing Jobs During the Business
Cycle Expansions, 1954-84

Trough	Peak	U.S.	Ohio
1954	1957	5.0	4.1
1958	1960	5.8	8.3
1961	1969	23.7	24.4
1970	1973	2.4	1.1
1975	1980	10.7	-0.3
1980	1981	-0.6	-2.5
1982	1984	7.9	8.9
Mean of increases		7.8	6.3

Second, in the 1980's Ohio's initial response to national economic recovery appears to be even more out of sync with the national business cycle patterns. Two full years after the 1982 recession, Ohio has yet to regain the 1981 level of average annual employment. In stark contrast, the U.S. economy generated new jobs at a rapid pace. U.S. employment in 1984 was up 3.6 percent over its previous 1981 all time peak of 91.2 million.

The slippage in the ability of Ohio's economy to generate new jobs during national economic recovery periods has resulted in Ohio's 1984 unemployment rate remaining well above the national rate. By historical standards, at this stage of an economic expansion, Ohio's unemployment rate should be equal or less than the national rate.

What is unsettling about the slippage in Ohio's ability to create jobs during periods of economic recovery is that it may portend a worsening of Ohio's already dismal long-run economic performance. The one bright spot is the sharp increase in Ohio's manufacturing jobs from 1982 to 1984, after years of decline (See Table 7).

V. What Are The Causal Factors?

Underlying the long-term performance and cyclical sensitivity of Ohio's economy is the performance of its manufacturing sector, which accounts for 25 percent of the jobs in Ohio. Manufacturing jobs in the U.S. are growing more slowly than growth in U.S. service jobs, but Ohio manufacturing sectors are generating new jobs at an even slower pace than nationally. Moreover, the ups and downs in Ohio manufacturing employment over business cycles are much more pronounced than they are nationally.

Table 8
Percent Change in U.S. and Ohio
Manufacturing Jobs During the Business
Cycle Contractions, 1953-84

Peak	Trough	U.S.	Ohio
1953	- 1954	-7.2	-9.5
1957	- 1958	-7.8	-13.3
1960	- 1961	-2.9	-6.2
1969	- 1970	-3.8	-4.2
1973	- 1975	-8.5	-11.5
1981	- 1982	-6.5	-10.5
Mean of decreases		-6.1	-9.2



Table 7 indicates that manufacturing jobs in Ohio increased, on average, 6.3 percent over seven recovery periods since 1953. U.S. manufacturing jobs increased an average of 7.8 percent over these expansion periods. On the downturns, Ohio's manufacturing jobs shrunk, on average, 9.2 percent in contrast to 6.1 percent for the nation (Table 8). Thus, it would appear that Ohio's manufacturing sector accounts for much of the deviation in Ohio's cyclical performance from national trends. The failure of Ohio's manufacturing jobs to keep pace with manufacturing job growth nationally also accounts for much of Ohio's lagging overall economic performance.

Factors that determine the short-run variability of a regional economy generally can be found in the structure of that region's economy and in its external trade relations with other regions. An economy with a disproportionate mix of cyclically sensitive industries will, in general, exhibit greater aggregate cyclical performance. The cyclical sensitivity of Ohio's manufacturing sector indicates that Ohio's mix of manufacturing firms is not significantly diversified. One stabilizing factor in the U.S. manufacturing sector has been the strong emergence of high-technology industries over the 1960's and 1970's. Ohio's economy over this period generated relatively few new high-tech jobs, and in comparison to other large manufacturing states, Ohio's share of the nation's high-tech jobs in manufacturing has been declining (Table 9).

The absence of a diversified mix of emerging innovation companies, generating new products and processes from which new industries emerge and old industries restructure, may also account for Ohio's lagging long-run performance in economic growth. The U.S. economy has been divesting of high-volume, low-cost manufacturing jobs and shifting to services and to high-value added manufacturing. As a result, high-tech value added in manufacturing output rose from 27 percent in 1960 to 38 percent in 1980. High-tech jobs in the U.S. manufacturing sector increased from 27 to 33 percent.⁵ The U.S. economy is not deindustrializing; value added in manufacturing as a percent of gross national product has remained around 25 percent for decades. The U.S. economy is reindustrializing and in the process its service and manufacturing sectors are becoming more dependent on advances in technology for new products and processes to remain competitive. One consequence has been strong growth in U.S. exports of service and high-technology products during the 1970 period. Another consequence has been a gradual increase in U.S. manufacturing jobs and the rejuvenation of many of America's basic industries.

In comparison, Ohio's absence of a comparable mix of high-tech service and technologically

Table 9
Relative Distribution of U.S. High-Tech Jobs by Selected States: 1975 and 1979

Selected States	Percent of U.S. High-Tech Employment 1979	Percent of U.S. High-Tech Employment 1975	Percent Change 1975-1979
Arizona	1.59%	1.28	24.2
California	15.85	14.40	10.1
Colorado	1.46	1.30	12.3
Texas	3.96	3.28	20.7
Utah	0.49	0.37	32.4
Washington	0.53	0.35	51.4
Nevada	0.10	0.06	66.6
Connecticut	2.60	2.70	-3.7
Maine	0.29	0.21	38.1
Massachusetts	6.13	5.80	5.7
New Hampshire	1.00	0.70	42.9
Rhode Island	0.53	0.55	3.6
Vermont	0.44	0.38	15.8
Illinois	6.69	7.89	-15.2
Michigan	2.54	2.51	1.2
New Jersey	5.02	5.75	-12.4
New York	10.34	11.74	-11.9
Ohio	4.46	5.11	-12.7
Pennsylvania	5.79	6.75	-14.2
Minnesota	2.89	2.60	11.2
Florida	2.71	11.10	29.0
Georgia	0.78	0.65	27.7
Maryland	1.03	1.00	3.0
Virginia	1.11	1.23	-9.8
North Carolina	2.31	1.89	22.2

SOURCE: Calculated from Eugene J. Doody and Helen B. Munzer, "High Technology Employment in Massachusetts and Selected States," a report prepared for the Massachusetts Division of Employment Security, Job Search, March 1981.

advanced manufacturing firms may explain why Ohio lags the nation in service and manufacturing job generation. Because Ohio's high-tech sectors have failed to keep pace with national trends, the ability of Ohio to compete for the growth in high-skilled, high-wage jobs is on the wane. This largely explains why Ohio's rank in per capita income among the states has slipped from tenth in 1950 to twenty-third in 1981. It also explains why Ohio's manufacturing sectors have failed to keep pace with the U.S. growth. In the 1970's, U.S. manufacturing exports were rising in the high-tech sectors. While U.S. manufacturing employment increased by 5 million between 1970 and 1980, Ohio's manufacturing employment actually declined.

VI. Trends and Cycles in the 1980's

The 1980's began with the United States and Ohio economies slumping to their worst recession since the 1930's. Unemployment rates soared well above 10 percent. The labor market recovery since December, 1982 has been brisk for the nation. The U.S. economy generated more than 6 million new jobs from 1983 to December, 1984. The nation's



unemployment rate fell from 9.5 percent to 7.1 percent over this period, a drop of 25 percent. As a result, the U.S. economy had more jobs in 1985 than it had in 1980. In contrast, Ohio's economy failed to generate enough jobs after 1982 to offset the loss of jobs during the 1982 recession. As a result, there were fewer manufacturing and service jobs in Ohio in 1985 than existed in 1980. This dismal performance in both the goods and service producing sectors is quite disturbing, since it indicates that Ohio's already poor long-term economic performance may have taken a turn for the worse.

The national recovery in the face of persistently high real interest rates, associated with tight monetary policy and high federal deficits, may explain Ohio's post-1980 lack-luster performance. By keeping the value of the dollar high, high real interest rates hinder U.S. exports of manufactured and service products. The U.S. Department of Commerce lists Ohio as the sixth largest exporting state. Because of its strategic role in U.S. exports, the high dollar may have reduced the competitiveness of Ohio's exports industries by as much as 30 percent. Also, because high real interest rates reflect the high cost of capital to firms, they make new investments necessary for job creation less attractive than they otherwise would be.

VII. Summary And Conclusions

Apparently, a significant change in the cyclical behavior of the Ohio economy in relation to the cyclical patterns of the national economy has occurred after 1953. Before 1953, changes in nonagricultural employment were greater for Ohio than for the U.S. economy. After 1953, however, U.S. employment growth during the expansion phase of a recovery exceeded Ohio's growth, but recessionary employment declines were greater for Ohio than for the U.S. economy. After 1975, another significant change emerged in Ohio's relative business cycle pattern. Ohio's economy has slipped in its ability to keep pace or exceed the nation in generating new jobs during economic recoveries, and it suffers greater losses during national recessions. In general, Ohio's economy is not only growing at a lower than national rate, it is also experiencing greater cyclical variations in nonagricultural employment. On the positive side, the recent resiliency of the Ohio manufacturing sector is some indication that Ohio may be experiencing a relative improvement in its economic performance.

What can Ohio do to improve its long-run competitiveness and reduce its cyclical instability? Economic diversification is the answer in both cases. For Ohio, this means providing a more attractive

environment for high-tech research, entrepreneurial expansion, and capital formation. Ohio needs to think strategically about its long-run role in the American and world economies. Public planners cannot wave a "magic wand" nor can they develop crash programs to accomplish economic diversification. However, government can remove barriers to entrepreneurship and innovation.

A more dynamic economy is necessary to speed up the long-run transition of Ohio's economy to a more diversified economic base. Ohio's labor markets, university programs and policies, financial markets, and government tax, expenditure, and regulatory policies must be studied in depth to uncover potential barriers to economic expansion. The strategic question to ask is this: "Is Ohio providing the necessary institutional environment, human capital investments, research facilities, and entrepreneurial incentives to fully participate in the mainstream of the nation's emerging high-tech, service economy?" The examination of Ohio's growth record in this paper suggests that much must be done before Ohioans can reap the full benefits of national economic growth.

References

¹The Joint Economic Committee attributes the reduction in U.S. productivity growth primarily to the decline in the growth of the nation's capital/labor ratio, but, since the productivity slowdown was even more pronounced in Western Europe and Japan, the committee did not view this decline as necessarily symptomatic of a loss in U.S. competitiveness. See U.S. Congress, Joint Economic Committee, *The 1981 Midyear Report: Productivity Report of the Joint Economic Committee* (Washington, D.C.: GPO, 1981, p.p. 1-25.)

²Robert B. Reich, "The Next Frontier," New York: Times Books, 1983.

³Ohio virtually mirrors the national patterns of labor forces composition by age and sex, and by labor force participation rates, according to Dixie Sommers, Director, Division of Labor Market Information, Ohio Bureau of Employment Services. See "The Ohio Labor Force: The Recession and Recovery"; comments before the Census Table, July 11, 1985, Cleveland, Ohio.

⁴Richard Sheridan, Michael Sobul, Mark Hoffman, and Wilbur Thompson, "Ohio's Changing Economy," "The Ohio Trends Review," Premier Issue, Vol. 1, No. 1, Summer 1985, pp. 25-30.

⁵See Table 4-8, p. 66 in Robert Z. Lawrence, "Can America Compete?" The Brookings Institution, 1984.



Transformation of the Akron Economy*

By Jack Dustin
James Shanahan
Michael Weddle

In 1980, Akron, a two-county Standard Metropolitan Statistical Area (SMSA) ranked 59th among all SMSAs in population size with 660,328 persons. Akron is similar in size to Jacksonville, Florida; Tulsa, Oklahoma and Syracuse, New York, and larger than Charleston, South Carolina; Knoxville, Tennessee and Tucson, Arizona. Most important, though, is that Akron is an integral part of a metroplex: the Cleveland/Akron/Canton/Lorain-Elyria/Youngstown region (see Map 1). The downtowns of Cleveland and Akron are separated by only 35 miles, while Akron and Canton are separated by 22 miles. Population, in the Northeast Ohio region overall, as in the Akron SMSA, is still declining; the Akron SMSA lost 3 percent of its population between 1970 and 1980. In 1980, the combined population of Northeast Ohio was 3,440,106.

Akron, Ohio is often cited as the quintessential "company" town populated primarily by working-class families who frequent bingo parlors, bowling alleys, and the neighborhood bars when not working the swing shift at the local rubber mill or keeping up with domestic chores.

The facts, however, describe a different kind of place. Over the years, manufacturing employment in Akron declined from 46 percent of total employment in 1964 to 28 percent in 1983. Even though rubber tire production, which accounted for much of the manufacturing employment, left the area, the big companies that once produced the tires stayed. As these rubber companies diversified through the

years, expanded their facilities nationwide, and grew into multinational corporations, they all made major investments in Akron for conducting central administration, research, and product development. Other firms in the region—many growing ones and even some declining ones—are concerned with sophisticated products. Consequently, Akron's economic future should follow two paths: one, as a place to carry out corporate headquarter functions; and second, as a place for small and medium size manufacturers that form and prosper from innovation activities. During the 1970's such certainty about Akron's economic future was not always evident. In fact, the city and its region went through many years of economic self-doubt and a general perception of living through crisis conditions.

The discussion below describes transformations and the crises affecting the regional economy. Out of the forces of change has come a new sense of economic purpose which has a potential for renewing the Akron economy. In some ways, Akron is literally building a bridge in this transitional period to a new economic future.

An Economic Infrastructure that Endures

In the period from 1870 to 1920, the technologically linked industries of steel, automobiles, and rubber emerged as powerful forces in the nation's economy that brought significant changes in places such as Akron. These industries raised Northeast Ohio to a national and world manufacturing center.

By 1920, Akron-based rubber companies successfully captured most of the market for automobile tires and converted the once small city into the "Rubber Capital of the World". Along with steelmaking companies located in neighboring cities, the large-scale tire/rubber production plants that clustered in Akron created important economies for their operations and for the region.

But the driving force behind the growth in rubber production came from the automobile industry in Michigan, not more than 150 miles away. The presence of these three national industries

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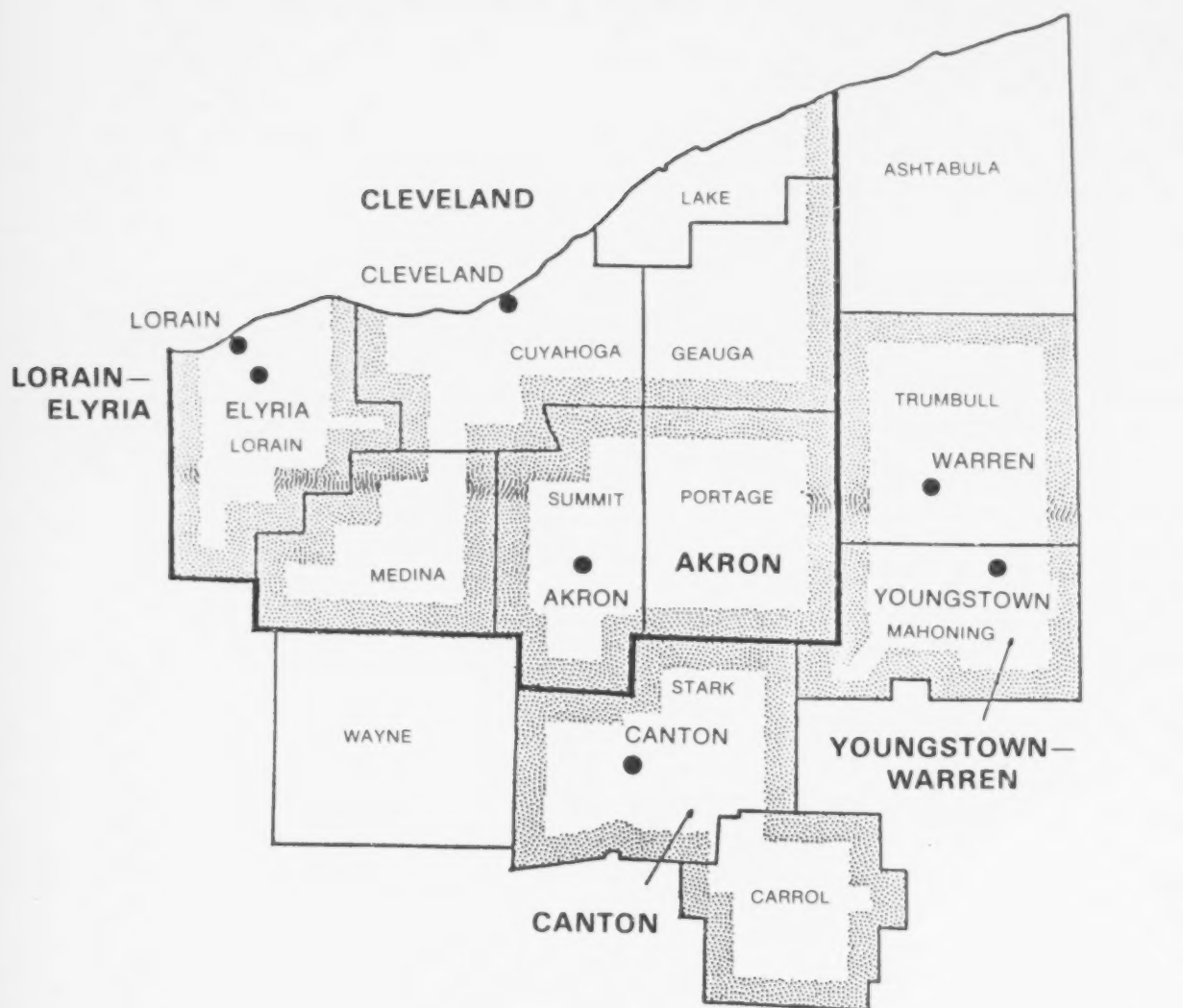
Shanahan, James and Weddle, Michael; "Transformation of the Akron Economy" (Akron, Ohio: Center for Urban Studies, The University of Akron) January 1985.

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MAP 1

AKRON: AN INTEGRAL PART OF NORTHEAST OHIO



Legend

— Standard Consolidated Statistical Area (SCSA)

Standard Metropolitan Statistical Area (SMSA)

Source: U.S. Department of Commerce, Bureau of the Census

Prepared by the Center for Urban Studies, The University of Akron



0 5 10 15 20 25 MILES



created locational advantages for important supply and support companies. Together the agglomeration of these industrial functions developed an economic infrastructure that still rivals any location in the United States.

Quickly following the establishment of large-scale rubber production plants in Akron, new companies formed to support and supply these operations with molds, dies, and various processing and material handling machinery. In turn, over time other companies rose to supply and support these industries, too, in fields such as metal forging and stamping. Many of these new firms were spun off by entrepreneurs formerly connected with the rubber companies, creating a strong industrial network.

Much of this development occurred in the initial decades of this century, given the explosive growth in rubber production, and gave Akron the image of a manufacturing city. However, this birthing process has continued throughout the years and, in recent years, has become more specialized and sophisticated.

Today, Akron's economic functions and employment base are both growing and changing. Economic activities once dominated by tire production have given way to corporate functions of

administration and research and to education, government, business and health services.

Akron's workforce has undergone dramatic change in structural form. Manufacturing employment has declined from a high of just over 100,000 jobs in 1953 to roughly 65,000 jobs in 1983. Despite this decrease in manufacturing jobs, total jobs in the Akron SMSA have *increased* during the last three decades, reaching a high of nearly 260,000 in 1979.

Job growth in Akron kept pace with the nation's until 1972. In the four years following the 1974-75 recession, job formation in the Akron SMSA grew at less than the national rate. The absolute number of jobs peaked in 1979 with 36 percent more jobs than in 1964 (see Fig. 1). Manufacturing employment as a percentage of the total began to decline in 1964 from 46 percent and reached a low of 28 percent in 1983. Despite these job losses, Akron employment has managed to grow because of sharp increases in services, trade and government sectors. For example, service jobs have more than doubled since 1964 as can be seen in Tables 1 and 2.

Importance of Nonmanufacturing Industry

The importance of nonmanufacturing firms in generating replacement jobs for the net loss in manufacturing has been crucial to Akron's economy. The service-oriented industry sector includes transportation services, communications and public utilities, finance, real estate, and insurance, miscellaneous other services (including business and health), and government. Over the last 20 years, Akron's nonmanufacturing base has developed into a broader and, in some cases, deeper mix of service/

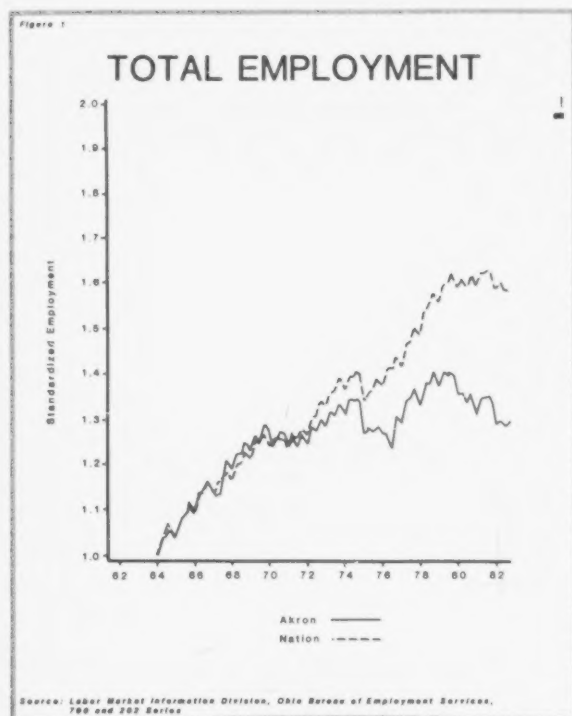


Table 1
Industry Change in the Akron SMSA, 1964-1983 (Industry Employment as Percent of Total Employment)

	1964	1974	1983	Change 1964-1983
Construction	3.3	3.3	2.8	-.5
Mining	.1	.1	.3	.2
Manufacturing	45.9	37.3	27.5	-18.4
Durable	19.8	17.1	13.6	
Nondurable	26.1	20.2	13.5	
Transportation & Utilities	6.3	5.7	4.9	-1.4
Wholesale & Retail Trade	18.8	21.1	23.7	4.9
Finance, Insurance & Real Estate	3.0	3.2	3.7	.7
Services	10.3	15.1	19.8	9.5
Government	12.3	15.2	17.2	4.9
	100.0	100.0	100.0	0.0

Source: Labor Market Information Division, Ohio Bureau of Employment Services, 790 Series.



Table 2
Comparison of Payrolls and Employment in
Selected Growing and Declining Industry
Groups in Akron SMSA

SIC	Industry Group	Akron SMSA Growth Rate 1974-1983	% of Total Employment in Akron SMSA, 1982	% of Total Payroll in Akron SMSA, 1982	Job Quality % Payroll - % Employees
I. FOURTEEN GROWTH GROUPS					
A. GROWTH FASTER IN AKRON SMSA THAN IN NATION (1964-1983)					
26	Paper & Allied Products	+1.1%	.745	.882	1.18
27	Printing & Publishers	+5.3%	1.321	1.435	1.09
54	Retail Food Stores	+4.3%	3.426	2.162	.63
58	Eating & Drinking Places	+43.8%	7.261	2.078	.29
63	Insurance	+2.9%	.797	.894	1.12
65	Real Estate	+11.6%	.646	.436	.67
73	Business Services	+51.9%	3.141	1.826	.58
81	Legal Services	+48.9%	.513	.600	1.17
B. GROWTH SLOWER IN AKRON SMSA THAN IN NATION (1964-1983)					
48	Communications	-5.7%	.909	-	-
49	Elec., Gas, Sanitary	+1.6%	1.800	-	-
57	Retail Furniture	-21.9%	.609	.431	.71
60-62	Banking/Finance	+15.4%	2.117	1.770	.84
76	Misc. Repair Services	-19.9%	.503	.409	.81
80	Health Services	+48.1%	7.494	6.921	.92
II. TWELVE DECLINING GROUPS					
A. DECLINING IN AKRON SMSA/GROWTH IN NATION (1964-1983)					
28	Chemicals	-12.6%	1.519	-	-
30	Rubber & Plastics	-45.0%	5.664	6.498	1.15
32	Stone, Clay & Glass	-39.7%	.872	1.092	1.25
35	Machinery (except electrical)	-28.4%	5.138	5.548	1.08
42	Trucking/Warehousing	-31.8%	3.528	4.762	1.35
52	Building Materials	-29.6%	.899	.700	.78
53	General Merchandise Stores	-34.2%	2.594	1.127	.43
70	Hotels/Motels	-26.2%	.799	.288	.36
B. DECLINING FASTER IN AKRON SMSA THAN IN NATION (1964-1983)					
20	Food & Kindred	-16.2%	1.071	1.123	1.05
34	Fabricated Metals	-27.2%	5.434	6.736	1.24
41	Passenger Transportation	-45.3%	.094	.056	.60
55	Auto Dealers	-28.2%	2.217	1.521	.69

Sources: Labor Market Information Division, Ohio Bureau of Employment Services; and "County Business Patterns," U.S. Department of Commerce, Bureau of the Census.



trade industries which more closely mirrors that of the nation.

Akron's fastest growing industries over the last two decades have been in nonmanufacturing and are by order of growth: business services (51.9 percent); legal services (48.9 percent); health services (48.1 percent); and eating and drinking establishments (43.8 percent). The yearly average employment growth rate for these industry sectors ranges from 4.4 to 5.2 percent over the last decade. A very distant fifth place industry is banking/finance (15.4 percent), where employment grew an average of 1.5 percent each year (see Table 2).

It appears that Akron's place in a service-oriented economy follows from important corporate functions of central administration and research and development. Other strengths of the region include trucking and warehousing, wholesale trade in durable goods, electric, gas, and waste services, and retail trade. Given its size and proximity to Cleveland, Akron's performance in support services is strong. Overall, the growth in business services and other professional services as reflected by the increasing number of regional offices of gas and electric utilities, communications, and financial institutions indicates a developing capacity within Akron's service sector to support corporate functions.

Importance of the Manufacturing Industry

Several sectors of manufacturing show varying degrees of performance in the Akron region, measured by job growth. These include printing and publishing and paper and allied products, which are growing faster in the Akron SMSA than the nation, and fabricated metals, nonelectrical machinery, chemicals, rubber and plastics, electrical machinery, aircraft and parts, and instruments. More specifically, industries experiencing good employment growth since 1974 are:

SIC¹ Industries New to Akron

264	Miscellaneous converted paper products
272	Periodicals
275	Commercial printing
278	Blankbooks and bookbinding
282	Industrial inorganic chemicals
284	Soaps, cleaners, and toilet goods
285	Paints and allied products

Traditional Akron Industries

307	Miscellaneous plastic products
347	Metal services
349	Miscellaneous fabricated metals
354	Metal working machinery
356	General industry machinery
358	Refrigeration and service machinery

¹SIC = Standard Industrial Classification, produced by the U.S. Bureau of Standards

High-Tech Industry in Akron

In almost any discussion of regional economic growth from manufacturing, the so-called "high-tech" industries are considered first and last as the evidence of a viable manufacturing economy. It is important, at least, to assess Akron's mix of technology-driven industries. First, though, some clarification is in order.

High technology is an overworked term with little precise meaning. Too often the term is restricted to microelectronics and space-age technologies. The approach used by recent scholars is to label an industry as high tech, not because the product involves sophisticated technology, but because of the degree to which the industry appears to develop or work with the evolving and most sophisticated technology for an industry sector. Working with sophisticated technology is reflected in the "capacity within an industry to apply scientific and engineering skills to the development of products and processes." This can be measured by the number of scientific professionals and technicians as a percent of the total workforce.

Using this measure, manufacturing industries that are technology oriented include:

- all of the chemical, instruments, electrical/electronic equipment industries;
- portions of the industrial machinery industry;
- automotive and aircraft and missiles in the transportation industry;
- tires and tubes in the rubber industry.

Using the same definitions of high-tech industries as applied in the national studies, Akron does surprisingly well (see Table 3). With and without the inclusion of tires and tubes industry employment, the share of total employment in the Akron-based industry that is in high-tech industries is close to the national average. Since 1974, excluding tires and tubes, the Akron region has experienced good growth in high-tech industries—11 percent overall from 1974 to 1980 (see Tables 3 and 4). This growth is most evident in the chemical industries, communication equipment, electrical equipment, surgical, medical and dental instruments, and refrigeration equipment. All these are growing from a modest employment base. As well, firms organized in the Akron region as research and development laboratories and computer and data processing services have grown at national rates.

High-tech industries which are declining in Akron include tires and tubes (over 9,000 net loss of jobs alone between 1974 and 1980) and selected special industrial machinery industries which are declining nationally as well.

The technological and professional orientation of the Akron manufacturing workforce has increased over time as the corporate functions of central administration and research and development have intensified and as the development of new high-tech industries has evolved. Managers and

Table 3
Employment in Technology-oriented
Industries, Akron SMSA, by Industry,
1974-1980

SIC Code	Industry	High Tech Group			Employment		Percent Change 1974-80	Percent of Total Manufacturing 1980
		I	II	III	1974	1980		
281	Industrial inorganic chemicals	X		X	276	1750 ^E	534.1 ^E	2.2
282	Plastic materials & synthetics	X		X	550 ^E	750 ^E	36.4 ^E	0.9
283	Drugs	X	X	X	-	-	-	-
284	Soaps, cleaners & toilet preparations	X		X	175 ^E	444	153.7 ^E	0.5
285	Paints & allied products	X		X	179	366	104.5	0.4
286	Industrial organic chemicals	X		X	375 ^E	375 ^E	0.0 ^E	0.5
287	Agricultural chemicals	X		X	-	60 ^E	-	0.1
289	Miscellaneous chemical products	X		X	309	335	8.4	0.4
291	Petroleum refining	X		X	-	-	-	-
301	Tires & inner tubes	X			20173	11028	-45.3	13.6
324	Cement, hydraulic	X			-	-	-	-
348	Ordinance & accessories	X		X	435 ^E	60 ^E	-86.2 ^E	0.1
351	Engines & turbines	X		X	-	-	-	-
352	Farm & garden machinery	X			175 ^E	53	-69.7 ^E	0.1
353	Construction, mining & material handling machinery	X			3815	3089	-19.0	3.8
354	Metalworking machinery	X			2657	3177	19.6	3.9
355	Special industry machinery, except metalworking	X		X	3593	2927	-18.5	3.6
356	General industrial machinery	X			542	681	25.6	0.8
357	Office, computing & accounting machines	X	X	X	-	-	-	-
358	Refrigeration & service industry machinery	X			60 ^E	141	135.0 ^E	0.2
361	Electric transmission & distribution equipment	X		X	175 ^E	-	-	-
362	Electrical industrial apparatus	X		X	1244 ^E	695 ^E	-44.1 ^E	0.8
363	Household appliances	X			-	-	-	-
364	Electric lighting & wiring equipment	X			550 ^E	750 ^E	36.4 ^E	0.9
365	Radio & TV receiving equipment	X		X	-	-	-	-
366	Communication equipment	X	X	X	88	348	295.4	0.4
367	Electronic components & accessories	X	X	X	119	394	231.1	0.5
369	Miscellaneous electrical machinery	X		X	-	-	-	-
371	Motor vehicles & equipment	X			951 ^E	852 ^E	-10.4 ^E	1.0
372	Aircraft & parts	X	X	X	3750 ^E	3750 ^E	0.0 ^E	4.6
376	Guided missiles & space vehicles	X	X	X	-	-	-	-
381	Engineering, laboratory, scientific & research instruments	X		X	-	-	-	-
382	Measuring & controlling instruments	X		X	175 ^E	283	61.7 ^E	0.3
383	Optical instruments & lenses	X		X	-	-	-	-
384	Surgical, medical & dental instruments	X		X	175 ^E	375 ^E	114.3 ^E	0.5
386	Photographic equipment & supplies	X		X	-	-	-	-
483	Radio & TV broadcasting	X			177	175 ^E	-1.1 ^E	-
489	Communication services, n.e.c. ²	X			-	-	-	-
491	Electric services	X			3750 ^E	3750 ^E	0.0 ^E	-
493	Combination electric, gas & other utility services	X			-	-	-	-
506	Wholesale trade, electrical goods	X			415	565	36.1	-
508	Wholesale trade, machinery, equipment & supplies	X			2389	3224	34.9	-
737	Computer & data processing services	X		X	147	413 ^E	180.9 ^E	-
7391	Research & development laboratories	X		X	60 ^E	244	306.7 ^E	-
891	Engineering, architectural & surveying services	X			643	1000	55.5	-
892	Noncommercial educational, scientific & research organizations	X			-	-	-	-

¹Group I. includes industries with a proportion of technology-oriented workers (engineers, life and physical scientists, mathematical specialists, engineering and science technicians and computer specialists) at least 1.5 times the average for all industries.

Group II. Includes industries with a ratio of R&D expenditures to net sales at least twice the average for all industries.

Group III. Includes manufacturing industries with a proportion of technology-oriented workers equal to or greater than the average for all manufacturing industries, and a ratio of R&D expenditures to sales close to or above the average for all industries.

Two nonmanufacturing industries which provide technical support to high-tech manufacturing industries also are included.

²Not elsewhere classified.

^EEstimate based on middle range for figures shown in County Business Patterns.

Sources: Richard W. Riche, Daniel E. Hecker, and John U. Burgan, "High Technology Today and Tomorrow: A Small Slice of the Employment Pie," Monthly Labor Review, November, 1983, pp.50-58.

"County Business Patterns", Ohio, U.S. Department of Commerce, Bureau of the Census, 1974 and 1980.



scientist/technicians comprise 21 percent and 23 percent, respectively, of total jobs in the rubber and plastics industry. In Canton these figures are 5 percent and 4 percent. In the industrial machinery industry, these figures in Akron are 9 percent and 12 percent of its manufacturing employment. Being technology oriented, Akron exceeds the average for metropolitan economies of its size and diversity.

Linking the Futures of Polymer Industries and the Akron Northeast Ohio Region

Wilbur Thompson, an eminent scholar in urban economics, advises that mature, sophisticated regional economies such as Akron and Cleveland can determine their comparative (competitive) economic advantage for industry according to:

- Routine operations, ranging across manufacturing, trade and services.
- Precision operations, focusing on industries employing more craftsmen and technicians.
- Research and development, serving as a center of science and technology.
- Central administration, performing the headquarters function.
- Entrepreneurship, capturing the propensity for spin-offs and new business formations.

The nearly total shift of tire-related production

from Akron to places such as Alabama and Oklahoma demonstrates clearly that *routine operations* employing low skill labor favor other regions and off-shore locations. Yet, proficiency in the science and technology of the industry can provide economic opportunity for the region. Jane Jacobs, a renowned city planner, stresses that "cities grow and become economically versatile by replacing goods that were once imported with goods they make themselves." This process of import substitution is prompted by *Innovation and Improvisation* — "adaptations in design, materials, or methods of production which create vigorous new exports from the region." (Jacobs, 1984)

Polymer Production in Akron

Despite the loss of rubber manufacturing of tires and tubes, significant production of other rubber products remains. Since the 1960's plastics manufacturing has expanded significantly and together rubber and plastic products have become the region's major source of polymer production.

Most importantly, Akron continues to be a production center for polymer products² and processing technology. Current demand trends call

²Polymer products include: rubber and plastic fabricated products, synthetic fibers, paints and coatings, and adhesives and sealants.

Table 4
Employment In All Technology-Oriented Industries, Akron SMSA, 1974-1980

SIC Code	Description of Analysis	Employment in High-Tech Groups						Percent Change		
		I		II		III		1974-80		
		1974	1980	1974	1980	1974	1980	I	II	III
281-892	Total Employment in Akron SMSA in All High-Technology Industries	48,122	42,054	3,957	4,492	11,825	13,569	-12.6%	13.5%	14.7%
	Total Employment in Akron SMSA in All High-Technology Industries Except SIC 301-Tires and Inner Tubes	27,949	31,026	No Change		No Change		11.0%	No Change	
	Total High-Tech Employment in Akron SMSA as Percent of Total Private Industry Employment	21.4%	17.7%	1.8%	1.9%	5.3%	5.7%			

Employment In Technology-Oriented Industries, Manufacturing Sector Akron SMSA, 1974-1980

281-386	Employment in Akron SMSA in Manufacturing High-Tech Industries	40,541	32,683	3,957	4,492	11,618	12,912	-19.4%	13.5%	11.1%
	Employment in Akron SMSA in Manufacturing High-Tech Industries Except SIC 301	20,368	21,655	No Change		No Change		0.6%	No Change	
	High-Tech Manufacturing Employment as Percent of Total Manufacturing Employment	44.0%	40.4%	4.3%	5.5%	12.6%	16.0%			

Source: "County Business Patterns", Ohio, U.S. Department of Commerce, Bureau of the Census, 1974 and 1980



for sophisticated and application engineered polymer products opening up new economic opportunities for experienced people and companies in the region. This advantage is further strengthened by the major U.S. cluster of custom processors of rubber or plastic materials. These companies often mix special chemical recipes for producers of specialized rubber and plastic related products and for companies pioneering new markets.

While overall employment in rubber and plastics manufacturing continues in a downward slide, firms which process plastic into products have been growing. By 1982, miscellaneous plastics accounted for 5 percent of Akron's manufacturing jobs, twice the national percentage, and second only to hoses and belts. Today miscellaneous rubber products provide almost one-third fewer jobs than in 1974, a loss that is greater than that occurring nationally. This change can be explained at least partially by the fact that some local firms are mechanizing their operations and converting to plastic products. In short, there are clear signs that low-technology plastics and rubber production in the region is in transition and the shift to new, sophisticated, products with limited runs caused decreases in local employment. However, the long term effect may be less negative than the numbers suggest.

Akron's Key Polymer Support Industry: Machinery

Machinery and mold, tool and die manufacturers started up in the area to support local rubber companies and, to a lesser extent, the steel companies. The history of this set of industries in the region to some extent parallels that of their customers. They grew along with steel and rubber production and helped expand their capacities by new technology development but through the years found it necessary to diversify in order to survive in very competitive markets.

Machinery manufacturing firms have lost 40 percent of their employment base since 1974 through closure and contraction, and contribute only 3 percent of the manufacturing jobs in Akron regional workplaces. In earlier years companies provided single customers with specialized equipment and services. As time passed, new areas of opportunity opened and technology transferred to new uses, customers, and industries. By the late 1950's, some equipment and technology could be standardized and fell to large centralized production companies. With declining tire production in the region beginning in the 1950's, the diversification of markets and generation of new technology and innovation became critically important. By the late 1970's, two decades of declining regional production, shutdowns, and disinvestment in rubber and steel eliminated those who lagged in new technology and those without sufficient capital to make a transition.

In effect, the region is left with fewer machinery firms; but those that remain for the most part are

technologically prepared for the rapid economic changes now occurring. These companies have a business plan built upon developing continuous flows of new technology needed by many different industries.

Mold, tool and die firms have suffered less in the transition and have been a growing industry over the last eight years. They now account for about 5 percent of Akron's manufacturing jobs. The typical firm has been in business for 17 years, employs 25 workers, and had \$1.7 million in sales in 1983. Customers' plants are located in Northeast Ohio, elsewhere in Ohio, and in states within a 300 to 400 mile radius. Some sell mostly to customers within this region, but most local firms primarily ship their products out of state.

Both machinery and mold, tool and die manufacturing firms are surviving in Akron, in part because of: their nearness to the headquarters of major industrial companies, the reputation and respect that area companies have among their customers locally and in the nation, and the network of businesses that supply these firms with needed materials and technical services.

Overall, manufacturing in Akron, Cleveland, and the surrounding SMSAs in Northeast Ohio include both technology oriented and "low-tech" concerns which are part of a high caliber technology infrastructure geared to polymer innovations. Developing new products and processing methods are interrelated and are important to understanding the capacity of the region for growth through innovation. The complement of firms extends from chemical suppliers who learned the trade from the bottom up to custom material mixers who service the small-to-medium size firms, to machinery and mold, tool, and die industries for bringing new products into production, to business services that range from moving products to financing the next new product line.

From the very beginning, it is evident that companies in Akron and elsewhere in Northeast Ohio were on the cutting edge of innovations in a broad range of polymer-based products for industry and consumer use. The cluster of major rubber manufacturers in Akron led the world in rubber applications, and that leadership carried over to plastics and other synthetic products. The polymer technology infrastructure—comprised of companies, institutions, and individuals, and a tradition of entrepreneurship—that has evolved in this region sets it apart from others.

Economic linkages across these organizations were forged by entrepreneurship and caused this region to become a major applied technology center for polymers in the U.S.

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Ohio Regional Forecasts for 1986

The Ohio economy is in reality an aggregation of eight separate regional economies, and each region merits individual consideration as we consider prospects for 1986. Economists in six regions filed the following forecasts for the coming year.

Cincinnati Metropolitan Area*

By Paul Pleeter and Ron Duritsch
University of Cincinnati

The economy of the Cincinnati area is expanding. However, it is not expanding at a rapid enough rate to produce a fall in the area's unemployment rate and to absorb some of the displacements that will take place in the manufacturing sector. At least three major cutbacks or plant closings are expected in the coming year, including the loss of 1,350 jobs with the closing of Ford Motor Co.'s Sharonville Plant. Given the continued growth of the nation's economy and the declining value of the dollar overseas, employment in the manufacturing sector is projected to decrease from 171,450 in 1985 to a level of 169,747 this year, largely as a result of these planned closings. Total employment in the area increased, however, from 756,800 approximately 767,500 in 1985. This gain is due to a forecast increase in the service and trade sector of approximately 10,000 workers over the year.

With sluggish growth in total employment and displacement of workers from manufacturing, the unemployment rate is forecast to increase to 8 percent. Using the most recent unemployment rates available, the metropolitan area's unemployment was 7.6 percent for 1985. The increase in the unemployment rate will result not only from a decline in manufacturing employment, but also from a projected increase in the area's labor force. Some growth in service sector employment will help offset these other factors.

Service sector employment traditionally has a lower available wage than does manufacturing employment. The impact of increased service sector employment is to increase area income while decreased manufacturing employment reduces personal employment. Given the relative shift in trends to lower paying jobs, nominal personal income is forecast to grow at a rate of 6 percent, a rate that is somewhat lower than the 6.5 percent in

unemployment rate not only from a decline in manufacturing employment but also from a projected increase in the area's labor force, attracted to some decrease but increased number of jobs made available in the service sector. Cincinnati in 1985 compared to a 5.9 percent growth rate for the U.S. Real personal income is forecast to decline from 3.1 percent in 1985 to 1.7 percent in 1986. A large part of the decreased rate of growth of real personal income is attributable to the rate of inflation. Prices in the Cincinnati area grew at a rate of 2.1 percent compared with 3.8 percent increase for the nation this past year. However, prices are forecast at a rate of 4.3 percent in 1986, a rate that is higher than that forecast for the nation.

Cleveland Metropolitan Area*

By Barbara Sherman Rolleston
Baldwin-Wallace College

The first five years of this decade saw the national economy experience severe cyclical swings—a protracted recession in 1981-82, following on the footsteps of a brief recession in 1980, and a historically robust economic recovery, which is beginning its fourth year. The Cleveland economy, with its heavy concentration in traditional manufacturing, saw little recovery from the 1980 recession and instead experienced an extended slump relative to the national economy. While total employment increased nationally by 1.6 percent between the two recessions (third quarter 1980 - second quarter 1981), Cleveland SMSA employment fell by 1.4 percent. While 1983 marked the first year of the national economic recovery, total SMSA employment continued a decline that began in 1980. Although manufacturing employment comprised only 25 percent of total area employment in 1983, it accounted for 100 percent of the 15,000 net decrease in jobs that year.

The pace of the economic recovery in the Cleveland area quickened in its second year. Although the 2.4 percent rate of employment growth locally was only about half the national rate in 1984, almost 20,000 jobs were created, 30 percent of which were in manufacturing. Particularly hard hit industries over the 1980-83 period in the Cleveland region were fabricated metals (declining 22.2 percent) and nonelectrical machinery (declining 37.2 percent). Perhaps reflecting the depth of their decline, these two industries were the only ones in

*The Cincinnati Metropolitan Area is the eight county region which includes Butler, Hamilton, Clermont and Warren counties in Ohio; Boone, Campbell and Kenton counties in Kentucky and Dearborn County in Indiana.

*The Cleveland Metropolitan Statistical Area (MSA) includes Cuyahoga, Geauga, Lake and Medina counties.



the durable manufacturing sector to show improvement in 1984 (increasing 7.4 percent and 8.4 percent, respectively). Employment gains in 1984 in the nonmanufacturing sector were strong, following sluggish growth in 1983, with construction showing the largest increase (6.7 percent). The only nonmanufacturing sector to register an employment decline in 1984 was state and local government, falling by 1.7 percent. Clearly, the cyclical rebound which has strengthened many nonmanufacturing industries has generally bypassed the state and local government sector, which saw its fourth annual drop in employment in 1984.

The economic recovery continued but, as generally anticipated, lost momentum in 1985¹. Like the national trend, local employment gains in the first three quarters of 1985 were generated entirely in the nonmanufacturing sector, which surpassed its prior 1979 employment peak. Local manufacturing employment, on the other hand, showed steady declines throughout the first three quarters of 1985, reaching its lowest level in more than two years. With nonmanufacturing gains exceeding losses in the manufacturing sector, total area employment grew throughout 1985, reaching its highest level since the end of the recession in 1982.

The Cleveland area unemployment rate dropped in 1985 to 8.4 percent from 9.0 percent in 1984. While these rates are above the U.S. average, the percentage decrease between 1984 and 1985 was much larger locally (6.7 percent) than nationally (4.0 percent). The rate of total local employment growth in 1985 was only one-third the national growth rate, yet Cleveland area manufacturers continued to maintain a longer workweek than the national average. This is likely to reflect the predominance of cyclically sensitive industries in the Cleveland area and the tendency for local manufacturing employers to proceed cautiously in a still uncertain economic environment.

In general, the magnitude of local employment changes in 1985 relative to the nation as a whole reflects the degree to which local manufacturing is concentrated in traditional capital goods industries. Locally, manufacturing employment declined 1.1 percent in 1985 compared to a .65 percent decline nationally, while local nonmanufacturing employment increased 1.6 percent, compared to a 4.3 percent increase nationally. Local capital goods producers, particularly of machine tools, steel, auto parts, and trucks, have been hard hit by the dollar's overall strength and their subsequent competitive disadvantage relative to foreign producers. In addition, the national investment recovery following

the last recession has been concentrated in computer and information processing equipment, industries in which the Cleveland area has been relatively weak.

As in the past, the prospects for the Cleveland economy in 1986 are strongly linked to the performance of the national economy, with local changes generally following but lagging behind national trends. In addition, the local economy is relatively disadvantaged even during recovery periods by its heavy concentration in older, basic capital goods industries and higher than average labor costs, changes in industrial structure favoring service and high-tech industries, and the high percentage of imported durable goods.

Most forecasters expect the national recovery to continue throughout 1986, although at a modest pace that will not greatly exceed the estimated 2.4 percent overall growth rate for 1985. Unemployment is not expected to drop significantly, while inflation should pick up later in the year once the effect of the weakening dollar is translated into domestic prices. In light of the national economic environment, the performance of the local economy is likely to be weak, particularly in the first half of 1986. Large automobile inventories entering 1986 may dampen employment in local auto-related industries, while the impact of the declining dollar on domestic manufacturing is not expected to be felt until late 1986 or early 1987. While interest rates are not expected to rise significantly in 1986, local consumer durable employment may weaken as consumers begin to retrench from their lengthy spending spree and rebuild their depleted savings. Growth in local producer durables industries may be limited by continued uncertainty over tax reform and ample industrial capacity. Overall, growth in the Cleveland economy in 1986 is likely to be sluggish at best, with gains occurring primarily in the latter half of the year.

Columbus Metropolitan Area*

By Henry L. Hunker
The Ohio State University

By late 1985, all seven counties in the Columbus MSA had rates of unemployment below the state average of approximately 9.5 percent, ranging from lows near 6 percent in Delaware and Franklin

¹1985 averages are based on data for the first three quarters of 1985.

*The Columbus Metropolitan Statistical Area, consisting of Franklin, Delaware, Fairfield, Madison, Pickaway, and Union counties, has been expanded recently to include a seventh county, Licking.



counties to a high of approximately 9 percent in Fairfield County. From an employment point of view, the Columbus MSA is healthy and expanding.

Much of the growth in employment throughout the MSA can be attributed to expansion of the service sector of the economy. The Columbus area economy exceeds the national rate of expansion in service employment, for example. It has also had a decrease in goods-producing employment, largely manufacturing and construction, double the national decrease in the 1978-1983 period. Thus, currently, employment in the service sector exceeds 75 percent of all employment in the Columbus MSA compared to approximately two-thirds so employed at the state level.

Major growth in service activities has been in general services (i.e., restaurant and hotels, business services, repair services, health, legal, and education services, etc.), in finance, insurance, and real estate services, and in wholesale and retail trade. Clearly, Franklin County is the heart of employment opportunity in the MSA: the County has 80 percent of all employment in the MSA and over 84 percent of employment in the services. Manufacturing accounts for a relatively larger share of employment in the other six counties of the MSA.

In general, the Columbus MSA is more reflective of the national than the state economy, primarily due to the more important role of manufacturing in Ohio. Overall, significant growth in employment in the Columbus MSA is anticipated in the next five years, with most of it coming in aspects of the service economy.

At the end of 1985, Columbus has two major buildings under construction in the Columbus Business District, both reflecting expansion in the service sector—a new state office building and a high-rise office structure, the latter at the long-vacant northwest corner of Broad and High streets, the city's major downtown intersection. In addition, construction of a major new retail shopping mall and associated parking facilities is planned for the long-dormant Capitol South project. Other construction plans are for a 110-unit, high-rise condominium along the riverfront, a riverfront restaurant at the confluence of the Scioto and Olentangy rivers, and the restoration and renovation of the Old Post Office Building to house offices of a local law firm. As in most major urban centers, the economic revitalization of the urban core, with attention to increased office space, expanded retailing opportunities, and some kind of residential space, remains a major focus of public and private sector interest and investment in the Columbus area.

Dayton Metropolitan Area*

By John E. Weiler
University of Dayton

The past year has been a good one for the Dayton area economy. The increase in employment, which began during 1984, continued in both manufacturing and nonmanufacturing areas. The Dayton unemployment rate has remained consistently below the average for Ohio. Heavily dependent on the auto and defense industries, area employment continued to benefit from growth in those industries. Similarly, 1986 promises modest expansion for the area's economy.

Nonmanufacturing employment has also grown. During the past ten years, the Dayton economy has successfully replaced manufacturing jobs with employment in service-related areas. Of particular importance have been finance and business services, wholesale and retail trade, and other service activities. The growth in retail sales, including automobiles, has had a favorable impact on Dayton. In addition, area construction has been increasing. This is especially true for nonresidential construction. Lower interest rates have been a factor in expanding construction, as well as in the rise of other local fixed investment.

As the growth in the national economy slows, the Dayton economy is likely to level off. The area is affected by the demand for durable consumer goods, especially domestically produced automobiles. In addition to the production of autos, trucks and components, the Dayton area has significant employment in the machine tool industry. Much of this industry is dependent on auto production and business capital investment. An economic slowdown is likely to have an adverse effect on both. Part of the reason for the dramatic increase in manufacturing employment was the addition of a second shift at the General Motors Corporation's Moraine truck plant. Unfortunately, this development is not likely to be repeated in the coming year.

One of the two largest area employers is Wright Patterson Air Force Base. Defense has been a growth industry during the Reagan years. However, defense spending is now receiving as much scrutiny as other portions of the federal budget. An increasing portion of Dayton area activity is related to high technology research and development, especially in defense-related activities. The

*The Dayton Metropolitan Statistical Area includes Montgomery, Miami, Clark, and Greene counties.



successful beginning of the Miami Valley Research Park, on the border of Montgomery and Greene counties, is likely to be a long-term positive influence on the economy. However, it will produce no dramatic increases in employment during the next twelve months.

Dayton's economy in 1986 is likely to mirror the national economy — a period of very modest expansion. Nonresidential construction will continue due to renovation in the downtown area and commercial development of the area along I-675. Another good year in the auto industry would be beneficial for the local economy. The lack of population and income growth will have a somewhat negative effect on retailing. However, the continued development of high technology and research activity is a promising sign for the long run.

Toledo Metropolitan Area*

By Michael Magura
University of Toledo

In 1984 the labor force in the Toledo area was about 290,000 persons, of which about 265,000 were employed. The unemployment rate stood at approximately 9 percent. This 9 percent rate represented an improvement over the 11 percent recorded for 1983.

The economic situation improved further during 1985. Both the labor force and the number of persons employed increased slightly. Although still above the national average, the unemployment rate fell during 1985 to the 8 percent range. The strongest gains were reported in the service and other non-manufacturing sectors. Manufacturing, with the exception of the transportation sector, showed very little improvement and, in some cases, declines. The weak performance in manufacturing employment was perhaps explained by the same productivity gains observed at the national level.

Further gains are anticipated for 1986. The non-durable goods, wholesale trade, retail trade, finance, insurance and real estate, and contract construction sectors are forecast to show increases in employment and payrolls during 1986. Coming off a rather robust 1985, the transportation equipment sector is expected to level off or slightly decline during 1986. Likewise, weakness is forecast for the stone, clay

and glass, machinery, and primary metal industries. Fabricated metal products, transportation and public utilities and services are expected to remain flat for the coming year.

Overall, employment in the Toledo area is expected to dip slightly during the first quarter of 1986. The second quarter promises about a 2 percent increase over the first quarter to be followed by a further 1 percent increase in the third quarter. The final quarter of 1986 is expected to show essentially no change from the third quarter.

Youngstown-Warren Metropolitan Area*

By Yih-Wu Liu
Anthony H. Stocks
Youngstown State University

With the notable exception of the transportation equipment sector, manufacturing activity in the Youngstown-Warren labor market in 1985 showed practically no improvement over 1984. Market demand for local steel mill products continued to be weak and this contributed to declining employment in the primary metals sector. A somewhat brighter picture is found in the nonmanufacturing sectors, especially in construction and wholesale trade. Construction benefited from the mixed blessings of lower interest rates and a tornado that produced extensive property damage and hence the need for considerable rebuilding in sections of the area. Wholesale trade continues to benefit from expansion in the national economy and proximity to regional markets. However, the growth of jobs in transportation equipment, construction and wholesale trade was not sufficient to lower local unemployment rates which continued at double digit levels in 1985.

What can be expected for 1986? The world-wide excess capacity in steel production seems destined to depress further jobs in local primary metals. In addition, the expected slow growth in the national economy is not likely to stimulate employment in other manufacturing sectors in the Youngstown-Warren area. As a result, we anticipate some decline in manufacturing jobs in 1986, but sufficient growth in the nonmanufacturing sectors to increase total employment by 2,000-3,000. This, coupled with out-migration, could reduce the unemployment rate below double digit figures by the end of 1986.

*The Toledo Metropolitan Statistical Area includes Lucas, Fulton, and Wood counties.

*The Youngstown-Warren Metropolitan Statistical Area includes Mahoning and Trumbull counties.





Econometric Model Generates 1986 Leading Indicator Forecasts for Ohio SMSAs

By James P. Lesage and Michael Magura*

This article describes the 1986 forecast from the leading indicator forecasting model first presented in the premier issue of *Ohio Economic Trends Review*. The model is an econometric model which establishes the historical nature of the relationship between economic variables felt to be leading indicators of future economic activity levels. Forecast of the future values of these index series are made using the interrelationships and time series properties of the data. The leading indexes forecast by the model are payroll, employment, retail sales, commercial loans, and housing values. Forecasts of these indexes are provided for each of the eight Ohio Standard Metropolitan Statistical Areas (SMSAs).

The econometric forecasting model was run with updated data to produce forecasts for the last two quarters of 1985 and all four quarters of 1986. Some changes in the econometric model used to produce the leading indicator forecasts are described below. In addition, some of the employment and payroll series from the Ohio Bureau of Employment Services (OBES) were redefined, based on new SMSA definitions. This required the use of the revised historical employment and payroll data base to create new index series used by the model.

One change in the reporting of the forecasts is the idea of reporting a "test" forecast in order to provide decision makers using the forecasts with with some idea of the relative accuracy of the forecasts. This involved running an experiment where a four quarter "test" forecast was done over the historical period from 1984-2nd quarter through 1985-2nd quarter. These historical forecasts are generated by the model in an identical way as the

future forecasts reported here. Since we know the actual data for this historical period, comparing the actual data with the forecasts allows us to assess the relative accuracy of the future forecasts. The test forecasts are plotted along with the historical data and the forecast six quarters into the future. These plots indicate that there is a great variation in the confidence that decision makers should assign to the various leading indicator index series being forecast.

The best accuracy appears to be associated with employment and payroll series, where most of the turns are correctly forecast during the 1984-2nd quarter through 1985-2nd quarter test period. The worst accuracy appears to be for the commercial loans and housing value leading indicators. Retail sales appears to be somewhere in between.

A summary check of the accuracy of the forecast provided in the first issue of *Ohio Economic Trends Review* is provided. This involved calculating the average percent error for each of the eight SMSAs. The average percentage error over the five quarters from 1984-2nd quarter to 1985-2nd quarter for the leading indicator series for each SMSA was calculated. The employment and payroll series were not available for all eight SMSAs because of the redefinitions of these areas by the OBES mentioned above. Table 1 below shows the average percentage error for each of the eight SMSAs.

It seems quite clear that the model's performance with respect to housing values and commercial loans was very poor. The other three series exhibit respectable errors. Housing values turned dramatically upward compared to the forecasted magnitudes. The model has been revised to incorporate a national mortgage rate variable in the housing values relations. The 90-day Treasury Bill rate has been added to the commercial loans relations in an attempt to improve performance here as well.

Turning our attention to the forecast for 1986,

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Table 1
Average percent error of the 1984-2 to
1985-2 forecasts SMSA/Leading Indicator

	Retail Sales	Payroll	Employment	Housing Values	Commercial Loans
Akron	9.2%	2.2	1.4	16.2	25.2
Canton	6.2	1.2	0.5	29.5	14.8
Cincinnati	1.3	1.1	1.1	26.6	4.9
Cleveland	2.4	1.2	0.4	38.6	20.8
Columbus	8.6	8.3	*	37.9	12.0
Dayton	14.5	6.4	*	55.6	13.2
Toledo	8.1	1.4	*	22.0	16.3
Youngstown	11.7	1.8	0.6	74.3	38.4

*Not available because of data definition changes.

there are a few points to note. First, the employment and payroll outlook seems very optimistic. Second, the end of 1986 shows a downturn in retail sales for all SMSAs. This seems consistent with some of the national forecasts which point to a downturn during the latter part of 1986.

Appendices

The graphs presented in the appendices differ slightly from those in the premier issue of *Ohio Economic Trends Review*. For each SMSA, three graphs are presented—for employment, retail sales and payroll. Each contains three separate lines—historical quarterly data from 1980, a six quarter forecast from 1985-2 and a four quarter test forecast 1984-3 to 1985-2.

The data also differ from the prior issue. In the initial issue, a five quarter moving average was applied to the data to provide smoothing, which allowed the relationships among the indicators to be shown. On the graphs in the appendices, the actual data are plotted.

Also, since the last issue, the Ohio Bureau of Employment Services redefined figures for employment, so those numbers vary from the prior tables.

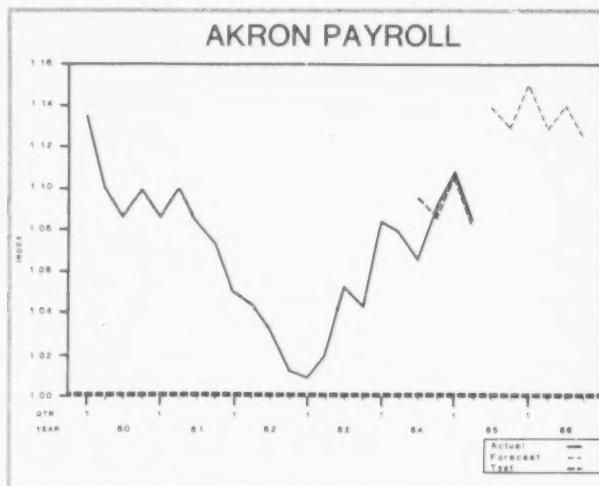
The application of the tables accompanying the graphs is the same as in the previous issue. The quarterly indices are provided, as well as the raw numbers for 1976-1, the base quarter of the indices.



Appendix 1 Akron SMSA

Historical Data and Forecasts

Leading Quarter	Employment	Commercial Loans	Payroll	Retail Sales	Housing Values
80-1	1 0659	0 7893	1 1352	1 0036	0 7966
80-2	1 0683	0 74	1 1	0 8986	0 6949
80-3	1 0505	0 7174	1 0863	0 9348	0 8051
80-4	1 0656	0 6763	1 0996	0 9583	1 0763
81-1	1 0302	0 63	1 0863	0 8768	0 678
81-2	1 0576	0 6578	1 0996	0 8261	0 6186
81-3	1 0594	0 6228	1 084	1 0145	0 4831
81-4	1 056	0 6516	1 0734	0 7047	0 322
82-1	1 0128	0 6629	1 0507	0 817	0 3475
82-2	1 0193	0 6711	1 0445	0 9529	0 3051
82-3	1 0022	0 6095	1 0316	0 7808	0 5254
82-4	0 996	0 6619	1 0133	0 7554	0 5424
83-1	0 9656	0 6567	1 0093	0 8967	0 7458
83-2	0 9856	0 6793	1 02	0 817	0 7881
83-3	0 9984	0 6187	1 0538	0 9366	0 5593
83-4	1 0146	0 6495	1 0436	0 8804	0 7797
84-1	0 9897	0 691	1 084	0 972	0 6651
84-2	1 0188	0 6844	1 0789	0 9657	0 8702
84-3	1 0231	0 7776	1 067	0 9886	0 6057
84-4	1 0371	1 1151	1 09	0 9429	0 7944
85-1	1 0188	1 0996	1 1082	1 04	0 4974
85-2	1 0382	1 107	1 0849	1 0571	0 5225
FORECAST STARTS HERE					
85-3	1 0569	1 1206	1 1394	1 0598	0 6689
85-4	1 0786	1 2819	1 1291	0 9581	0 7573
86-1	1 06	1 3446	1 1496	1 0101	0 7667
86-2	1 0803	1 4137	1 1285	0 9977	0 9448
86-3	1 0778	1 3646	1 1396	0 9973	0 8248
86-4	1 0847	1 3786	1 1245	0 9207	0 8351
TEST FORECASTS					
84-3	1 0298	0 7172	1 096	0 9702	0 686
84-4	1 0497	0 7174	1 0861	0 9284	0 6806
85-1	1 0239	0 9262	1 1067	0 9801	0 7499
85-2	1 0535	0 9009	1 0832	0 9765	0 6397
NOMINAL VALUES					
76-1	246,967	146,776	423,986	175 0	14,585





Appendix 2 Canton SMSA

Historical Data and Forecasts

Leading Quarter	Employment	Commercial Loans	Payroll	Retail Sales	Housing Values
80-1	1 1088	0 9099	1 1624	0 9651	1 2826
80-2	1 1186	0 8426	1 1205	0 8304	0 663
80-3	1 0884	0 7762	1 062	0 9214	1 3152
80-4	1 1043	0 8465	1 1005	0 9239	1 1848
81-1	1 0865	0 7792	1 1171	0 8167	1 2826
81-2	1 1104	0 7406	1 118	0 8666	1 0435
81-3	1 1132	0 7673	1 1078	0 7668	0 6087
81-4	1 0961	0 8644	1 1185	0 6696	0 6739
82-1	1 0481	0 7733	1 0444	0 8092	0 4239
82-2	1 0631	0 7455	1 0371	0 8815	0 4457
82-3	1 0509	0 7069	1 0239	0 813	0 9022
82-4	1 019	0 804	0 9707	0 8928	0 5217
83-1	0 9805	0 8426	0 9566	0 8229	0 7283
83-2	1 0075	0 8416	0 9341	0 789	0 8913
83-3	1 0181	0 801	1 0093	0 8815	0 837
83-4	1 0272	0 901	0 9649	0 884	0 6413
84-1	1 0152	0 867	1 0429	0 9063	0 5622
84-2	1 0511	0 8878	1 0164	0 8968	0 7075
84-3	1 0574	1 0455	1 028	0 8889	0 8672
84-4	1 0591	1 0102	1 0207	0 9603	0 6856
85-1	1 0406	1 0015	1 0494	0 8968	0 7143
85-2	1 0661	1 0787	1 0464	1 0794	0 8257

FORECAST STARTS HERE

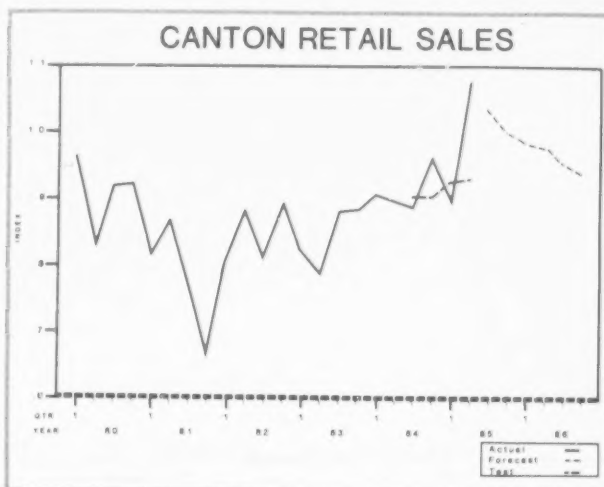
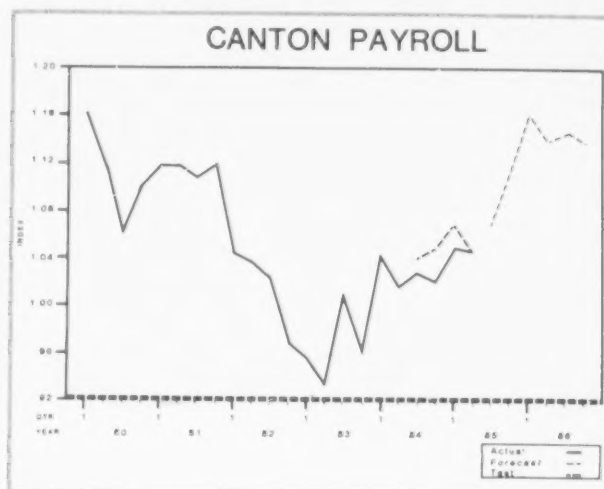
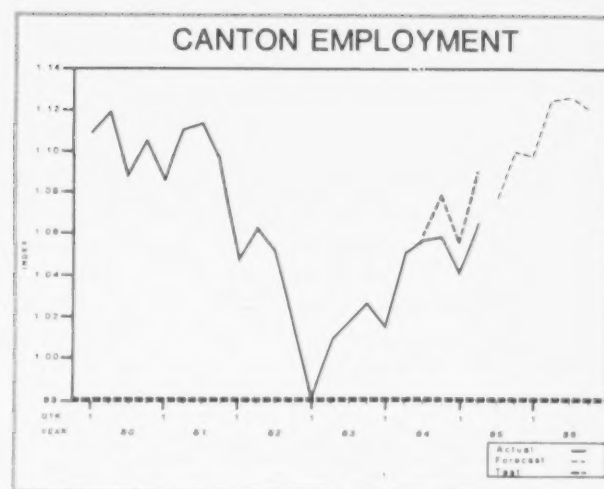
85-3	1 0764	1 3446	1 0704	1 0313	0 9777
85-4	1 0999	1 4698	1 1175	1 0004	0 9626
86-1	1 0981	1 5646	1 1619	0 9845	1 0298
86-2	1 1249	1 4001	1 1385	0 9782	1 1416
86-3	1 1264	1 4687	1 1463	0 9537	1 1398
86-4	1 1202	1 5167	1 1382	0 9382	1 0594

TEST FORECASTS

84-3	1 0595	0 917	1 0418	0 9042	0 7065
84-4	1 0786	0 9517	1 0492	0 9049	0 5431
85-1	1 0561	0 9811	1 0685	0 9276	0 6926
85-2	1 0915	1 1111	1 0457	0 9304	0 9428

NOMINAL VALUES

76-1	142.200	92.841	269.505	126.0	6.716
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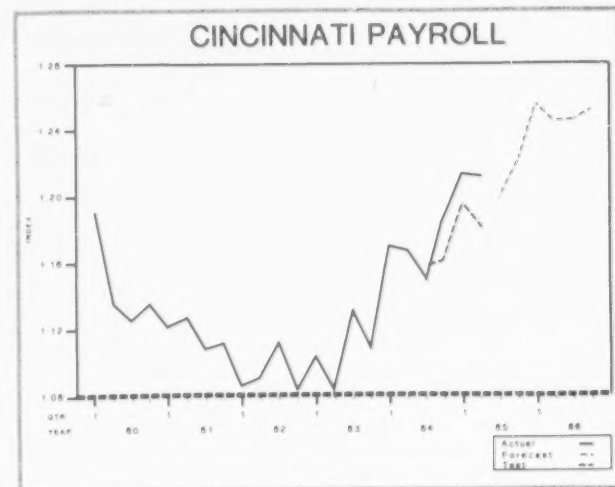
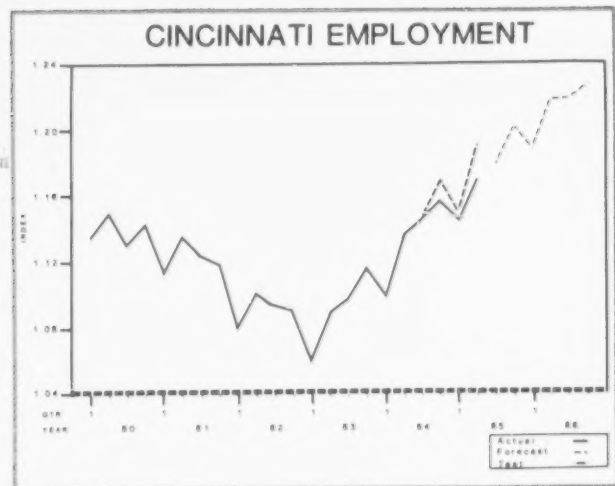




Appendix 3 Cincinnati SMSA

Historical Data and Forecasts

Leading Quarter	Employment	Commercial Loans	Payroll	Retail Sales	Housing Values
80-1	1 134	1 0127	1 1913	0 9382	0 6418
80-2	1 1496	0 9463	1 1363	0 8824	0 4328
80-3	1 1304	0 9052	1 1257	0 8793	0 7761
80-4	1 1422	0 9491	1 1358	0 9321	0 8881
81-1	1 114	0 8741	1 1217	0 902	0 6343
81-2	1 1355	0 8444	1 1272	0 8024	0 5597
81-3	1 1235	0 6011	1 109	0 991	0 3731
81-4	1 1191	0 8557	1 1116	0 6787	0 2761
82-1	1 079	0 8699	1 0868	0 8235	0 4478
82-2	1 101	0 8444	1 0919	0 8537	0 306
82-3	1 0939	0 8501	1 1116	0 8356	0 3284
82-4	1 0901	0 8543	1 0838	0 8175	0 4776
83-1	1 0611	0 9109	1 1045	0 8703	0 7164
83-2	1 0889	0 9406	1 0848	0 7964	0 5672
83-3	1 0977	0 9576	1 1307	0 9367	0 7612
83-4	1 1169	1 0311	1 11	0 8884	0 6045
84-1	1 0994	1 05	1 1696	0 9502	0 6902
84-2	1 1358	1 1125	1 1675	0 9637	0 6246
84-3	1 1448	1 1648	1 1513	0 9783	0 6956
84-4	1 1569	1 2057	1 1871	0 9754	0 9302
85-1	1 1448	1 2415	1 2134	1 0047	0 6635
85-2	1 1697	1 2896	1 2119	1 0193	0 7229
FORECAST STARTS HERE					
85-3	1 1792	1 4862	1 1995	1 0543	0 8416
85-4	1 2013	1 6444	1 2209	0 9902	0 8794
86-1	1 188	1 7897	1 2544	1 0168	0 8865
86-2	1 2172	1 684	1 2446	0 9885	0 8927
86-3	1 2183	1 6844	1 246	1 0124	0 8832
86-4	1 2262	1 6747	1 2503	0 9574	0 8907
TEST FORECASTS					
84-3	1 1462	1 0765	1 1581	0 9845	0 57
84-4	1 169	1 1858	1 162	0 9448	0 7774
85-1	1 1499	1 2666	1 196	0 972	0 7007
85-2	1 1899	1 4203	1 1814	0 9534	0 796
NOMINAL VALUES					
76-1	527,333	358,507	866,394	341 4	43,183

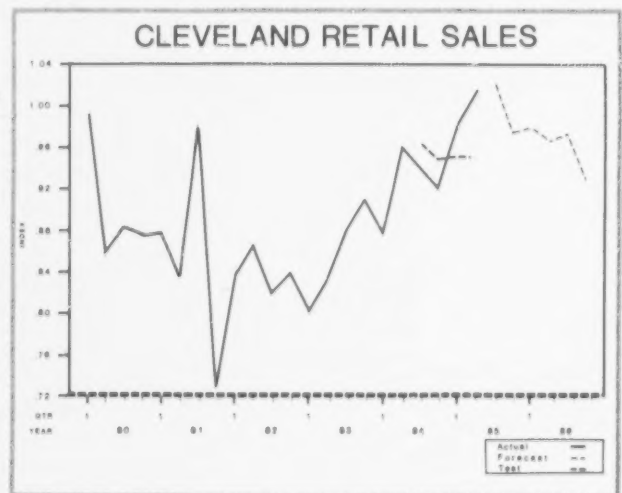
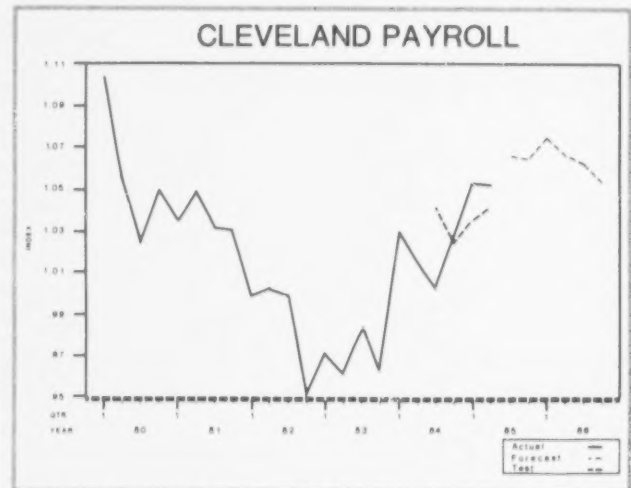
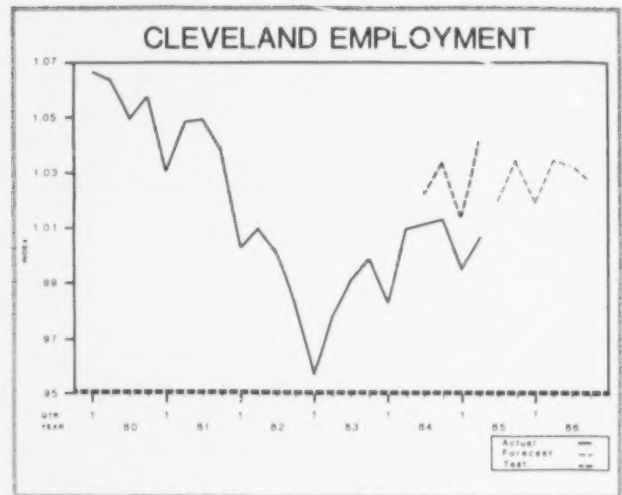




Appendix 4 Cleveland SMSA

Historical Data and Forecasts

Leading Quarter	Employment	Commercial Loans	Payroll	Retail Sales	Housing Values
80-1	1 0665	0 9031	1 1044	0 9919	0 4643
80-2	1 0635	0 8053	1 0522	0 8591	0 2857
80-3	1 0493	0 7833	1 0239	0 8832	0 45
80-4	1 0574	0 7868	1 0494	0 8752	0 7214
81-1	1 03	0 7392	1 0344	0 8779	0 4
81-2	1 0486	0 7084	1 0489	0 8336	0 45
81-3	1 0491	0 7313	1 0316	0 9825	0 3929
81-4	1 0381	0 7463	1 03	0 7235	0 2286
82-1	1 0026	0 793	0 9983	0 8376	0 2143
82-2	1 0098	0 8044	1 0022	0 8658	0 2429
82-3	1 0011	0 874	0 9989	0 8201	0 2286
82-4	0 9818	0 8881	0 981	0 8389	0 3071
83-1	0 9565	0 8934	0 9706	0 8027	0 5214
83-2	0 978	0 8714	0 9617	0 8322	0 5143
83-3	0 9909	0 9048	0 9833	0 8805	0 6
83-4	0 9987	0 9357	0 9628	0 9101	0 5357
84-1	0 9824	0 9048	1 0302	0 8767	0 5886
84-2	1 0095	1 1254	1 0149	0 9611	0 6439
84-3	1 0117	1 1599	1 0025	0 9398	0 4736
84-4	1 0132	1 153	1 0312	0 9207	0 4465
85-1	0 9945	1 1784	1 0535	0 9824	0 7021
85-2	1 0072	1 2096	1 052	1 0142	0 6437
FORECAST STARTS HERE					
85-3	1 0192	1 3518	1 0761	1 0253	0 6809
85-4	1 0345	1 4251	1 0943	0 9741	0 7166
86-1	1 0189	1 4304	1 1257	0 9794	0 7585
86-2	1 0342	1 3995	1 1382	0 9669	0 8031
86-3	1 0325	1 4037	1 16	0 9734	0 7277
86-4	1 0271	1 3466	1 1753	0 9294	0 7085
TEST FORECASTS					
84-3	1 0219	1 0576	1 0417	0 964	0 5643
84-4	1 0341	1 2233	1 024	0 9485	0 5493
85-1	1 0136	1 1868	1 0356	0 9524	0 5932
85-2	1 0413	1 3496	1 0421	0 9514	0 7197
NOMINAL VALUES					
76-1	845,633	1,146,470	1,558,958	470 3	55,657





Appendix 5 Columbus SMSA

Historical Data and Forecasts

Leading Quarter	Employment	Commercial Loans	Payroll	Retail Sales	Housing Values
80-1	1 1398	2 1383	1 1634	0 9414	0 8723
80-2	1 1499	2 0706	1 1411	0 8887	0 5957
80-3	1 1306	2 0245	1 1402	0 8556	1 0213
80-4	1 1607	2 0202	1 155	0 9323	1 0851
81-1	1 1268	2 0245	1 1356	0 8842	0 8298
81-2	1 1473	2 0158	1 1458	0 8451	0 617
81-3	1 1336	2 0158	1 1323	0 9699	0 4113
81-4	1 1459	2 1787	1 1388	0 6692	0 2057
82-1	1 1101	2 2622	1 1134	0 8541	0 3333
82-2	1 1205	2 304	1 1499	0 818	0 4184
82-3	1 1017	2 3156	1 1481	0 8195	0 4823
82-4	1 1161	2 4683	1 1305	0 7609	0 6809
83-1	1 0866	2 572	1 162	0 7955	1 0567
83-2	1 1171	2 5893	1 1601	0 8586	0 7943
83-3	1 127	2 4726	1 1994	0 8692	1 0851
83-4	1 153	2 6657	1 1569	0 8902	1 0496
84-1	1 1406	2 6	1 2811	0 9715	1 4827
84-2	1 1754	2 9146	1 2417	0 922	1 2187
84-3	1 1766	3 0874	1 2848	0 9165	1 1421
84-4	1 206	2 8927	1 2876	0 9056	1 5541
85-1	1 1904	2 9386	1 3329	0 9602	1 1501
85-2	1 2139	2 9197	1 3316	0 9793	1 4326

FORECAST STARTS HERE

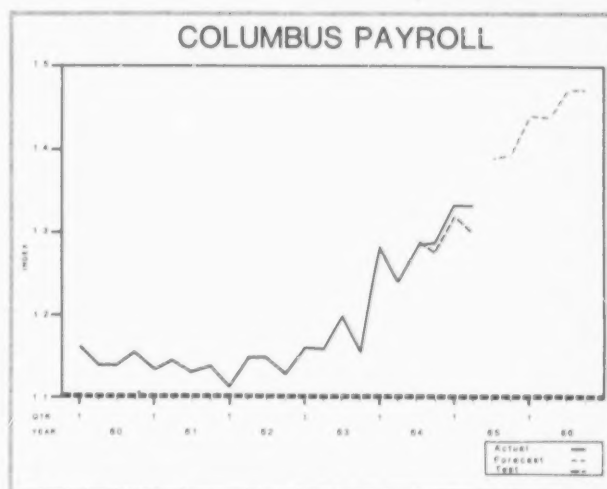
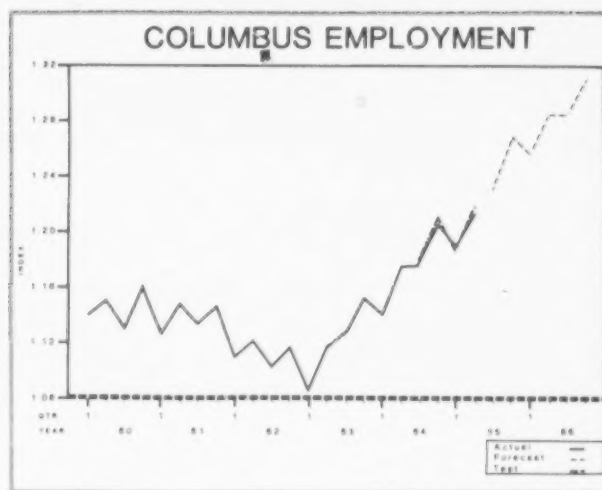
85-3	1 2308	3 4098	1 3903	0 9794	1 4628
85-4	1 2694	3 6147	1 3959	0 9511	1 5558
86-1	1 2569	4 0632	1 4435	0 9604	1 554
86-2	1 2853	3 9222	1 4415	0 9446	1 5164
86-3	1 2847	4 1638	1 4758	0 9397	1 4318
86-4	1 3099	4 2027	1 4777	0 8888	1 4522

TEST FORECASTS

84-3	1 1802	2 7562	1 2911	0 9295	1 1488
84-4	1 2107	3 0382	1 2758	0 8979	1 3175
85-1	1 1865	3 2101	1 3197	0 9301	1 2777
85-2	1 2208	2 7777	1 2985	0 9324	1 3423

NOMINAL VALUES

76-1	489,167	283,309	717,936	336 6	36,638
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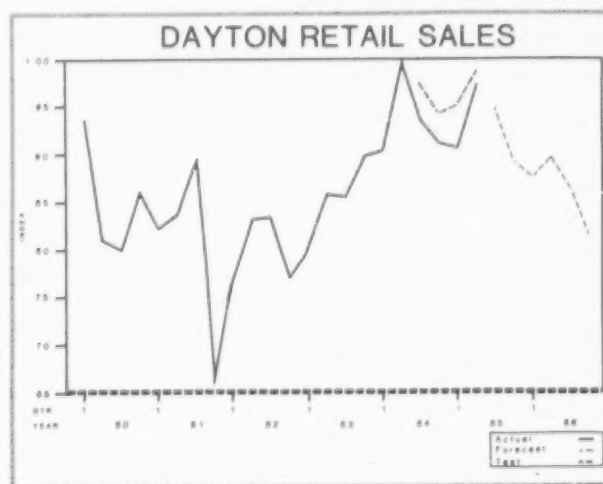
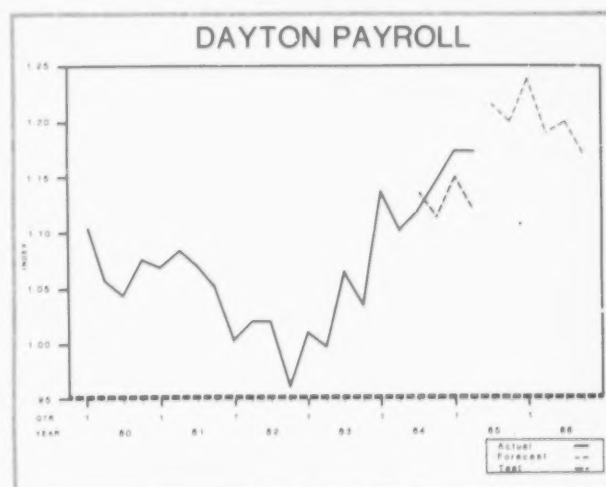
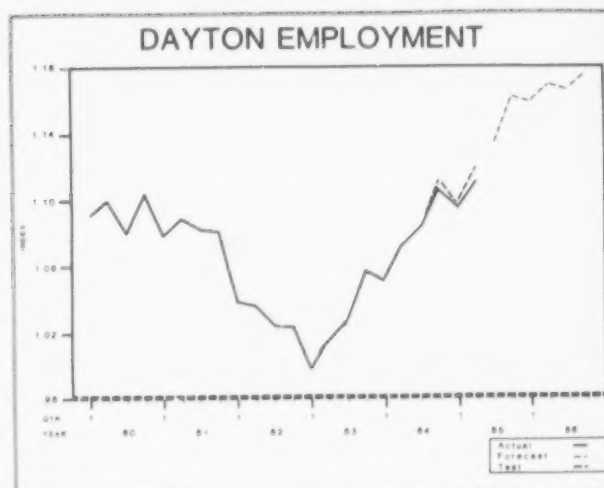




Appendix 6 Dayton SMSA

Historical Data and Forecasts

Leading Quarter	Employment	Commercial Loans	Payroll	Retail Sales	Housing Values
80-1	1 0909	1 0324	1 1056	0 9373	0 4106
80-2	1 0989	1 0152	1 056	0 8104	0 4305
80-3	1 08	0 9493	1 0433	0 7997	0 4967
80-4	1 1037	1 0304	1 0757	0 8585	0 5166
81-1	1 0782	0 9899	1 0687	0 8224	0 3841
81-2	1 0885	0 9858	1 084	0 8358	0 2781
81-3	1 0822	0 9909	1 0706	0 8945	0 2185
81-4	1 0812	1 0132	1 0503	0 6636	0 0728
82-1	1 0379	0 9635	1 0032	0 7704	0 245
82-2	1 0361	0 0838	1 0197	0 8318	0 1722
82-3	1 0245	0 9483	1 0197	0 8344	0 1854
82-4	1 0238	0 9828	0 9599	0 7717	0 2781
83-1	0 9983	0 9301	1 0095	0 7997	0 4768
83-2	1 0165	0 9149	0 9962	0 8585	0 4172
83-3	1 0281	0 846	1 0642	0 8558	0 3046
83-4	1 0572	1 0405	1 0331	0 8985	0 3046
84-1	1 0516	0 99	1 1363	0 9037	0 3441
84-2	1 0723	1 0981	1 1008	0 9948	0 3871
84-3	1 0829	1 1356	1 1193	0 9372	0 4715
84-4	1 1057	1 1301	1 1473	0 911	0 3674
85-1	1 0954	1 3125	1 1739	0 9058	0 3965
85-2	1 1118	1 3343	1 173	0 9738	0 5527
FORECAST STARTS HERE					
85-3	1 1331	1 5553	1 2146	0 9473	0 5543
85-4	1 1617	1 6203	1 2012	0 8914	0 5291
86-1	1 1585	1 8186	1 244	0 8761	0 5758
86-2	1 1689	1 7253	1 192	0 8959	0 5979
86-3	1 1658	1 8674	1 2016	0 8646	0 5576
86-4	1 1767	1 8756	1 1734	0 8146	0 5103
TEST FORECASTS					
84-3	1 0813	1 0594	1 1357	0 9737	0 4304
84-4	1 1117	1 1227	1 1139	0 9425	0 2986
85-1	1 0978	1 1388	1 151	0 9522	0 3943
85-2	1 1189	1 1987	1 1194	0 9877	0 4725
NOMINAL VALUES					
76-1	363,200	166,195	502,125	191,0	27,293

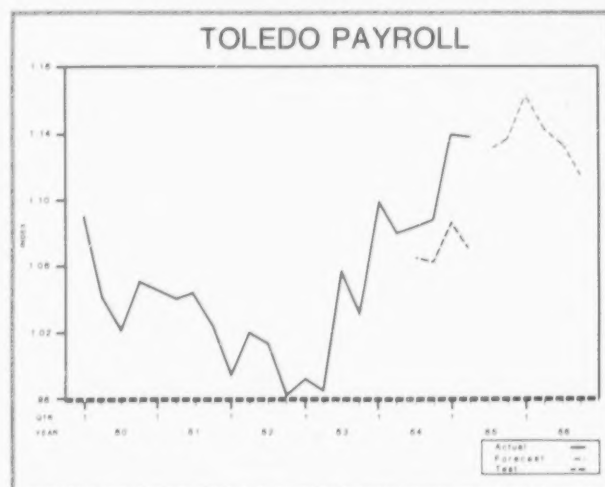
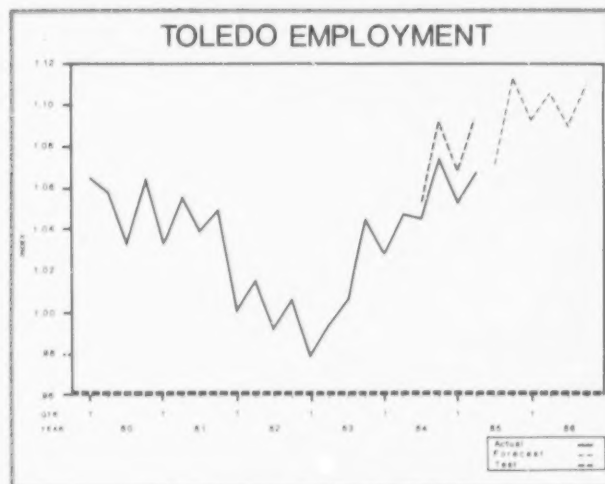




Appendix 7 Toledo SMSA

Historical Data and Forecasts

Leading Quarter	Employment	Commercial Loans	Payroll	Retail Sales	Housing Values
80-1	1 0645	0 9634	1 0898	0 958	0 6078
80-2	1 0579	0 8944	1 0402	0 8995	0 5245
80-3	1 0338	0 9362	1 022	0 8976	0 7059
80-4	1 0658	0 9142	1 0507	0 9835	1 0098
81-1	1 0326	0 8567	1 0457	0 9506	1
81-2	1 0557	0 8556	1 0408	0 8428	0 549
81-3	1 039	0 8881	1 043	1 0475	0 3529
81-4	1 0487	0 8964	1 0242	0 7038	0 2304
82-1	1 0007	0 9174	0 9939	0 8172	0 1716
82-2	1 0159	0 9372	1 0204	0 9708	0 3775
82-3	0 9923	0 9383	1 0127	0 8282	0 3676
82-4	1 0063	0 8264	0 9818	0 83	0 3039
83-1	0 9786	0 9195	0 9923	0 9104	0 3971
83-2	0 9941	0 9121	0 9846	0 7971	0 5245
83-3	1 006	0 9299	1 0567	0 9104	0 5294
83-4	1 0449	0 9916	1 0309	0 8629	0 4412
84-1	1 029	1 01	1 1001	0 9971	0 3936
84-2	1 0475	1 0128	1 0795	0 956	0 4269
84-3	1 0452	1 061	1 0829	0 9853	0 3869
84-4	1 0747	1 1776	1 0877	0 9326	0 409
85-1	1 0533	1 2668	1 1393	0 9677	0 4068
85-2	1 0682	1 4081	1 1374	0 9853	0 4615
FORECAST STARTS HERE					
85-3	1 0703	1 4671	1 1276	0 9981	0 5863
85-4	1 1133	1 5315	1 1341	0 928	0 6125
86-1	1 0925	1 481	1 1513	0 9775	0 6296
86-2	1 1057	1 5253	1 1251	0 95	0 6702
86-3	1 0892	1 5003	1 1159	0 9637	0 6933
86-4	1 11	1 4873	1 098	0 9071	0 6318
TEST FORECASTS					
84-3	1 0531	0 9886	1 0647	0 9709	0 4113
84-4	1 0915	1 1226	1 0621	0 9391	0 5037
85-1	1 0681	1 1907	1 0862	0 9892	0 5165
85-2	1 0947	1 2169	1 0691	0 9615	0 591
NOMINAL VALUES					
76-1	243.500	176.315	413.220	170.5	24.172

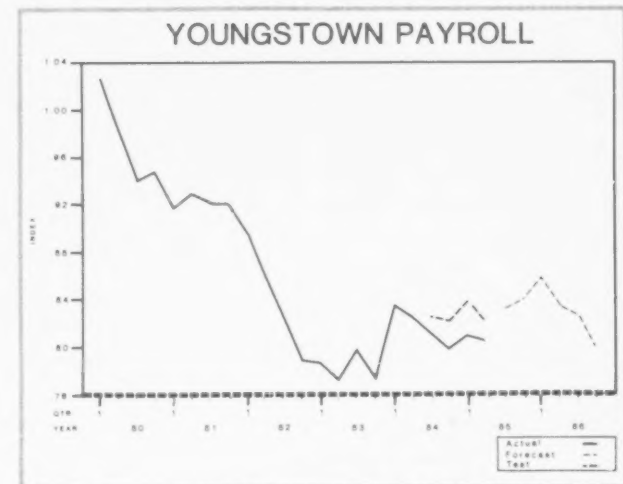




Appendix 8 Youngstown SMSA

Historical Data and Forecasts

Leading Quarter	Employment	Commercial Loans	Payroll	Retail Sales	Housing Values
80-1	1 0402	1 0109	1 0269	0 7797	0 5177
80-2	1 0287	0 9819	0 9801	0 7227	0 5248
80-3	1 0027	1 0043	0 9393	0 7334	0 8936
80-4	1 0127	0 9196	0 947	0 7488	0 9858
81-1	0 9837	0 9029	0 9174	0 7442	0 9433
81-2	1 0146	0 9667	0 9287	0 6487	0 6879
81-3	1 0079	0 9029	0 9221	0 9461	0 3972
81-4	0 9894	0 9594	0 9198	0 5809	0 2908
82-1	0 9253	0 9442	0 896	0 7134	0 234
82-2	0 9281	0 9725	0 8583	0 6656	0 3759
82-3	0 9038	0 9826	0 8263	0 6117	0 3546
82-4	0 8743	1 0145	0 7889	0 6317	0 4397
83-1	0 8579	0 9674	0 787	0 6733	0 6383
83-2	0 8938	1 1225	0 7726	0 6194	0 539
83-3	0 905	1 2159	0 7975	0 7304	0 5532
83-4	0 9117	1 3145	0 7741	0 6564	0 6099
84-1	0 8978	1 12	0 8363	0 7302	0 5013
84-2	0 9231	1 3012	0 8254	0 7242	0 0624
84-3	0 9194	1 2836	0 8127	0 7937	0 0593
84-4	0 9258	1 4507	0 8002	0 7044	0 0471
85-1	0 9075	1 6172	0 8107	0 7341	0 0557
85-2	0 9246	1 6426	0 8063	0 7937	0 0614
FORECAST STARTS HERE					
85-3	0 94	1 8054	0 8299	0 8272	0 2065
85-4	0 9566	1 9175	0 8397	0 7483	0 303
86-1	0 9362	2 0125	0 8573	0 8006	0 4186
86-2	0 9439	2 0454	0 8341	0 776	0 4827
86-3	0 9278	2 1316	0 824	0 81	0 4092
86-4	0 9122	2 1267	0 7972	0 7341	0 398
TEST FORECASTS					
84-3	0 9321	1 2944	0 8256	0 7581	0 1043
84-4	0 9389	1 4293	0 8227	0 7266	0 1129
85-1	0 9113	1 49	0 8398	0 7719	0 2481
85-2	0 9426	1 7916	0 8208	0 7523	0 2502
NOMINAL VALUES					
76-1	198,900	77,989	204,644	100.8	7,044





Viewpoint: Interstate Tax Competition and Economic Development

By Harold A. Hovey*

My purpose here is to deal with the clash between the desires of state officials for economic development and their quest for rational state and local tax policy. For the benefit of tax policy specialists, I will play the role of a development professional. Some tax policy specialists may not like where the argument leads, but the problem is that to beat it they should be able to refute it intellectually and beat it under political combat conditions. The last decade of state tax policy changes suggests this isn't easy.

The Economic Development Imperative

These objectives are rarely questioned. I am aware of only two cases in the last decade in which state officials have said publicly that they wanted to avoid growth. One was a controversial governor of Oregon and the other involved many officials of Vermont whose rhetoric on land use implied opposition to growth. Neither of these exceptions exist today.

Economic growth is popular because it implies something for everyone. For the disadvantaged, it means higher incomes and access to jobs. For average state residents, it means job opportunities for their children and higher value for their property. For government officials, it implies more revenues without having to raise taxes.

Growth is an establishment theme as well. The real winners from growth are people who produce goods and services under circumstances where the costs of serving additional customers are well below the revenues to be gained from them. At the top of this list are the media which gain advertising revenue but have little or no change in production costs as

their audiences grow. Also on the list are department stores, professionals such as lawyers and doctors, firms that supply the construction industry and contractors and even union leaders. The other gainers from growth are those that own property as growth inevitably leads to property value increases.

Growth is not as much a panacea as many people imagine, but its drawbacks tend not to get mentioned much. The views of local officials notwithstanding, growth can increase government costs faster than revenues. Growth can drive up wage rates and reduce the available labor supply — both minuses for businesses already established in an area. Growth can bring congestion on the highways and increase pollution problems. Growth-driven increases in property values are bad news for existing renters and persons who aspire to purchase a home. But these factors are generally discussed as reasons for "planned growth," not as reasons to prevent it.

The evidence of the growth imperative is everywhere. In 1982, when unemployment was high, practically every candidate for statewide office was talking growth. Despite improvements in the economy since, I cannot think of a race for governor in which the candidates didn't try to outpromise each other on economic development issues. State budgets for economic development agencies have been growing rapidly and will likely continue to do so.

Perhaps the best evidence of the universality of the growth objective is the apparent necessity to package nearly every state policy in its wrappings. Education reform in the South was sold in the name of economic growth — a need to have workers competent in basic skills. Higher education is being sold on the basis of needing high quality institutions to attract new versions of Boston's Route 128 and North Carolina's Research Triangle. Infrastructure spending is also sold in the name of growth.

The Strategy of Encouraging Growth

There is substantial debate in the academic literature over what causes a state or local area to grow, with issues like whether people cause jobs or jobs draw population.

But in the world of the practical people who staff

*Dr. Harold Hovey is a consultant on state and local policy and the editor of *State Policy Reports* and *State Budget and Taxes*. Hovey was the state director of finance in Ohio from 1971 to 1973, budget director for the state of Illinois from 1973-75 and has held positions with Battelle Institute in Columbus, the U.S. Office of Management and Budget, and the Defense Department. This column is based on an address Hovey delivered at the National Conference of State Legislatures tax conference in October 1985 in Denver, Colorado and will be published in a book of papers delivered at the conference.



local chambers of commerce and state development agencies, there is widespread understanding of the economics of the situation. The common sense of the small town development committee is also reflected in the literature of regional economics.

For a state or local community to increase the income of its citizens relative to those of other states, it must change its terms of trade with the outside world. The most obvious way to do this is manufacturing — local residents producing goods that fetch consumer dollars all over the country and perhaps the world. So states and communities went after manufacturing through “industrial development” programs or what detractors call “smokestack chasing.” While it has become fashionable to emphasize other aspects of development strategies, smokestack chasing is alive and well, as the fierce competition for General Motors Corporation’s Saturn plant showed.

But smokestack chasing could not be the salvation of all American communities at once because there simply aren’t enough smokestacks to chase. Employment in manufacturing in the United States today is about what it was ten years ago. This means gains in manufacturing employment in some places must be offset by losses elsewhere. In addition, it became increasingly obvious that some money spent on smokestack chasing was being wasted. For example, nearly half of the space in industrial parks nationwide is unused.

So those interested in development started looking harder at other ways to improve their terms of trade. State officials recognized federal spending as a major force and began devoting more attention to where it goes as evidenced by the proliferation of state offices in Washington. State officials recognized that increasing the sales of an existing in-state firm could be as valuable as a new firm and began programs of technical assistance, sharing university research and export promotion. They recognized that large service operations could have as much impact as manufacturing and states such as Delaware and South Dakota began to chase banks and credit card companies. Also bringing money into the state by tourism promotion, encouraging motion picture productions, and conventions were recognized. Some development agencies also recognized that reducing imports from the outside world by substituting domestic production could be as valuable for development as increasing exports. As a result, many states are pushing in-state products to in-state consumers.

New development programs appear every year and quickly spread to every state. Once begun, they are continued essentially without exception.

Development Strategy and Tax Policy

For as long as any of us can remember, a classic argument against any state and local taxes has been that they discourage business. This is presumed by some to be the case regardless of the form of the taxes. In its purest form, this argument makes absolutely no sense because it presumes irrational behavior by business decisionmakers. I assert that many business leaders operate reasonably intelligently to maximize profit and that, over time, those who do tend to win out over competitors who don’t.

Such a decisionmaker would not let business location decisions be controlled by the level of state and local spending or level of taxes. Instead they would key on the tax and spending policies affecting the firm. Alaska has, by far the highest state and local taxes in the country, but they fall primarily on oil companies rather than other forms of business or individuals. It makes no sense to argue that a garment producer should be deterred from an Alaska location because of high taxes on oil companies, a Nevada location because of high gambling revenues, or a Wyoming location because of high severance taxes on coal.

“In the early smokestack-chasing days, industrial development programs were designed to reduce two prominent elements of manufacturing costs As time passed, the development tool kits extended to every conceivable way of reducing costs.”

The appropriate decision rule for anyone who has selected a good or service to produce is to *minimize production and distribution cost*. These costs have many components — the cost of transporting raw materials, labor costs, taxes, utility costs, plant operating costs, and distribution costs. A firm’s interest in state and local policy should logically, and does, extend to the web of all government policies affecting cost. Those include the characteristics and maintenance of roads, the pricing of municipal services such as water supply, the regulatory effects on utility rates, the costs of training ill-educated workers and the waste and spoilage they cause, the labor costs associated with recruitment to particular locations, regulatory delays, other paperwork imposed by government, and all forms of taxes.



This is not the place for a discussion of the vast literature on the determinants of business location to and simply concur in Larry Ledebur's conclusion (*In Industrial Incentives: Public Promotion of Private Enterprise*) that their costs are underrated and their effectiveness overrated.

But there is a major point overlooked frequently in the literature, which is the effect of taxes on existing firms. Analysis tends to focus on the movement of firms, of which there is very little, and the siting of new facilities like the Saturn plant. But as I write, furniture manufacturers from New York and North Carolina are competing for customers as are computer makers in Texas, California, and Massachusetts, and millions of firms in thousands of markets. New York taxes don't have to drive a firm out of the state to have an impact. That impact can be the shrinking and closure of a firm in one state and expansions and "new births" of competitors in another.

In the early smokestack-chasing days, industrial development programs were designed to reduce two prominent elements of manufacturing costs — taxes and the cost of capital—using the tools of property tax abatement and industrial revenue bonds. As the years have passed, the development tool kits extended to every conceivable way of reducing costs. States and communities discount land or give it away, make loans and even contributions to capital, provide buildings, offer services such as research and development, industrial engineering, market research, train workers, offer discounted utility rates and reduce taxes.

Tax Policy from an Economic Development Perspective

Our friends in the development business are paid to increase the number of jobs in a state. Most of them are at least vaguely aware that this cannot result from activities, such as barbershops, that merely redistribute a fixed amount of money within the local economy. They are acutely aware of the importance of decreasing the costs of operation in their state. Therefore, it should not surprise anyone to find them advocating state policies moving in the direction of eliminating all state and local taxes paid on operations, such as manufacturing, that have choices of where they locate and expand. In this effort, they have natural allies in the business community itself and, increasingly, organized labor.

As every fiscal analyst knows, there is considerable pressure to move tax policy in this direction. Property taxes, which have a high incidence on business, are being systematically

reduced in their relative contribution to state-local revenues, with the slack being taken up by taxes and the individual income tax. States continue to move to take manufacturers' inventories and machinery and equipment out of the property tax base. Many states avoid levying sales taxes on business-to-business sales and sales tax concessions periodically appear as economic development concessions, as recently happened in the state of Washington. State officials, with exceptions, haven't been looking to raise the rate of corporate income taxes when they need additional revenue. Meanwhile, they generally have adopted the erosion of the base reflected in Accelerated Cost Recovery System (ACRS) and ending unitary treatment. State-initiated erosions of the corporate income tax base increase every year. Enterprise zone tax breaks and the credits for expanding employment are the most fashionable current examples.

In addition, economic development professionals will be sensitive to any aspect of tax policy for individuals that is viewed as hindering economic development. The prime candidates by this criterion are the top bracket individual income tax rate and inheritance and estate taxes. This year alone, there were many examples of reductions in both.

When the development professionals get around to more mundane matters they will also find some other taxes that affect the costs of footloose firms, such as utility and telephone excise taxes.

From a development perspective (*only*) it is not hard to design an ideal state and local tax system. That system would place heavy reliance on consumption taxes, particularly the sales tax and selective excises such as those on alcoholic beverages, tobacco, and insurance premiums. Moving to such reliance would force states now without a sales tax to adopt one. It is not surprising that, partly in the name of economic development, Oregon leaders campaigned for such a tax in the fall of 1985 and may well do so again. Such a system would place relatively low reliance on property taxes affecting business. This result could be reached by placing less reliance on property taxes generally, by tax abatements, by assessment policy, and by systematically excluding large categories of business from the property tax base.

The corporate income tax would be reduced in many ways. First the symbolically important marginal rate would be dropped, as Pennsylvania has done. Second, there would be credits primarily benefiting footloose industry with West Virginia providing the most recent example of just how far this can go. There also would be reductions in the top bracket personal income tax rate.

I think it is fair to say that our state tax systems



are evolving in the direction of the tax policies I have outlined. Is feared interstate tax competition the reason? The answer is clearly yes for all the changes except the reduced reliance on the property tax, which relates primarily to the lack of popularity of the tax and successful efforts to get states to foot more of the bill for schools.

Will the trend be reversed anytime soon? I consider this very unlikely in the absence of federal tax reform legislation. I am not sure that state officials will be willing to increase the tax burdens on footloose business even if there is federal reform, like that proposed by the President, that will increase business taxes to finance reductions for individuals.

Are the Results Bad State Policy?

So far I have been discussing tax policy as though it were a simple matter for states to increase reliance on one tax to offset reductions in another. This is unrealistic in the real world, where reductions in personal top bracket rates, exemption of corporate tangible property, and corporate tax credits translate, in part, into lower state and local spending. Thus, when we talk about interstate tax competition, we are partly talking about interstate competition in keeping state and local spending low.

Is there such competition? You bet there is. It is most strongly felt at the borders. New York changes its bank taxes to keep New York banks from becoming New Jersey banks. Virginia cuts its liquor revenues in the northern part of the state, only, to compete with the District of Columbia. Washington tried to apply special lower rates of sales taxes in counties bordering Oregon. Arkansas tries to reduce the income tax on citizens of Texarkana, which sits on the border of income-taxless Texas. But it is also felt in other ways. In state after state, legislative leaders, development officials, and governors appoint blue-ribbon committees to recommend how to improve economic development. In state after state, these groups come back with tax comparisons and recommendations to reduce business and top bracket personal income taxes. While the studies may show taxes to be a minor factor, legislators tend to be more impressed by face-to-face statements by local business leaders.

Does the competition make a difference in the level of state and local spending? It's impossible to prove that an answer to this question is right or wrong, but I think it is having a major effect in the higher tax states. It shows in Wisconsin and Minnesota, where state leaders of both parties, citing business climate, are looking for ways to slow the growth of state and local spending. It shows in Michigan where Draconian cuts have been made in state government activities. It shows in decisions on

state tax structure and spending levels in New York and Pennsylvania. It made a difference in Massachusetts, which is now touting its reduced tax burdens, making it more difficult for a state like Rhode Island to maintain its spending patterns.

It isn't hard, from an economic development perspective, to see what expenditures have to give in such a competition. Investments that are key to corporate competitiveness — ranging from roads, water supply, sewage treatment, and arguably education — must be maintained in the name of development. This tends to put the pressure on safety net programs, such as AFDC (Aid to Families with Dependent Children), Medicaid, and special programs such as those for the homeless. It also puts pressure on public employee compensation. A reduction or elimination of the deductibility of state and local taxes from federal taxable income would exacerbate these effects, so it should be no surprise that leaders of New York and public employees are leading the struggle to save it.

It is my view that interstate competition in taxes already causes AFDC payments, AFDC eligibility, Medicaid eligibility and coverage, and various other safety net activities to be less well funded than they would be if decisions about them were made on a national basis. The competition also produces considerable downward pressure on workers' compensation leading to ridiculous results such as awarding someone 100 times as much if maimed by negligence of his doctor than if maimed by the negligence of his employer.

"I do not fear the effects of interstate competition in education . . . But the competitive strategy for the safety net is not to have one."

This situation is exacerbated by massive mismatches of needs and fiscal capacity among the states. In the ten years I have been consulting with state officials I have done considerable work in states that represent the extremes — Arkansas and Mississippi on the one hand and Connecticut and Alaska on the other. Connecticut and Alaska can clearly afford just about any state policy you can think of, even giving bonuses to citizens. For Mississippi and Arkansas to provide the national average of state and local services, their taxes would have to be 70 percent above the national average for state and local taxes. This isn't done, and won't be, as nearly everyone — firms and individuals — with



money would simply shift to low-tax Louisiana, Texas, and Tennessee.

It has long been the position of most state officials that these problems would best be handled by a federal commitment to more of the costs of safety net programs. I do not fear the effects of interstate competition in education, where state officials seek lower taxes and better education. Some may opt to tax less and teach less, but they may not emerge the winners as education does have something to do with economic development. But the competitive strategy for the safety net is not to have one.

While concerned about the impacts of interstate tax competition on spending levels and priorities affecting the safety net, I am less concerned about the interstate tax competition as it affects tax policy.

Because the reasons why I am not concerned make me sound more extreme on the subject than most corporate leaders, I must first try to convince you that I am not a tool of business. I am an economist and lawyer by training. In my 26 years of working life, I have worked for state and federal governments and not for-profit organizations totally, with the exception of a couple of years with an association of utilities whose officials perform more like government executives than my image of the corporate world. But like millions of self-employed professionals, I do have my own little corporation. That we have them is the first reason to doubt our system of corporate taxation. As a state official, I had a lot to do with the evolution of Ohio from a state with no corporate income tax in 1970 to the third highest corporate rate in the country in 1984.

Professional economists have considerable doubt about taxing the income of corporations at all. I picked three public finance textbooks at random. One (Richard Wagner, *Public Finance: Revenue and Expenditures in a Democratic Society*) hemmed and hawed so much that I couldn't tell what the author thought. The second (Richard and Peggy Musgrave, *Public Finance in Theory and Practice*, page 270) comments:

The role of the corporation tax in a good tax system is by no means obvious. If the appropriate tax base is viewed in terms of consumption, there is clearly no case for a corporation tax. Corporate source income should then become taxable only if and when it is distributed and spent by the recipient. But the case for a corporation tax may be questioned even in the context of an income-based approach. Here taxation at the corporate level may be viewed as a mere device for integrating corporate source income into the individual income tax, rather than as an additional, "absolute" tax on corporate source income.

The third book (Bernard Herber, *Modern Public Finance*) begins its discussion with the comment: "On theoretical grounds it is difficult to justify the existence of a corporation income tax separate from the personal income tax."

While much ink gets spilled on the subject, a pretty convincing case can be made that the burden of the corporate income tax is shifted to consumers, not stockholders. If so, the tax is simply a hidden sales tax. It is also true that the tax hurts the competitiveness of our industries because we have agreed to international rules that say the United States cannot rebate the tax on production for export while other countries rely on taxes they can and do rebate to promote exports.

But states cannot undertake the reform of personal income taxes that would be required to end the corporate income tax and make the affluent bear at least the share of the tax burden, as they do today. National leadership would be required for that. Furthermore, not many state officials are likely to advocate openly the reduction of taxes on business. But they are willing to provide tax breaks to corporations in the name of promoting development through enterprise zone exemptions, investment credits, employment expansion credits, and research and development credits. All these reduce the effective rate at which states tax corporations, which I view as an acceptable result, and garbage up state tax systems, which I view as an undesirable but probably inevitable result.

Reflecting a feeling that such taxes are also shifted to consumers, I also do not bemoan the erosion of the corporate property tax base and a reduced reliance on property taxes generally, nor the tax reductions and exemptions that states are adopting for productive equipment such as industrial and farm machinery. If interstate tax competition furthers this result, the competition is not to be bemoaned, so long as business taxes and user charges are kept high enough to cover the few services that corporations, as such, get from government like transportation and police and fire protection.

In summary, interstate tax competition has probably caused tax burdens on the corporate entity to be lower than they would without such competition. But I don't see any serious problem with this result other than the fact that hiding it from the public causes some deadweight paperwork burdens.

But I do view with alarm what interstate competition appears to be doing to our systems for taxing individuals.

Of most concern are estate and inheritance taxes. There are clear value judgements involved here. My judgement is that allowing the children of



the affluent to have the financial head start they get from inheritances of the magnitudes now allowed to pass free of taxation is unfair in the extreme. To combine such a policy with allowing people to accept massive appreciation of assets like common stock and pass them along with a stepped-up basis ought to convince every low-income citizen that we have rigged "the system" against them, which we have.

"A significant erosion of deductibility of state and local taxes from income subject to federal tax will intensify the interstate competitive pressures for obvious reasons."

But what can officials of an individual state do about estate and inheritance taxes? Essentially nothing. There is enough mobility among the affluent elderly so that state officials have little choice but to keep their taxation of estates mild.

The other concern is the impact of interstate competition on top bracket individual income rates. Even when we have federal deductibility, I believe, but cannot prove, that states with high top bracket income tax rates are paying a price in economic development. I don't know how high the top rate has to be to be troublesome, but my guess is 7 percent, including both state and any local taxes. I count 13 states under considerable pressure by this test. Leading the list are states such as West Virginia, New York, California, Minnesota, Maine, Hawaii, Wisconsin, Vermont, Delaware, and Rhode Island. There hasn't been recent action in any one of these states to cut top bracket rates, but it has happened in a significant number of them.

A significant erosion of the deductibility of state and local taxes from income subject to federal tax will intensify the interstate competitive pressures for obvious reasons. In addition, I believe it will trigger modifications of tax systems in many states to alter the effective burdens of state and local taxes to restore roughly the burden distributions before deductibility was constrained or ended. This means lower top bracket rates.

These results should not be greatly surprising. In our mobile society, it is simply not possible for a single state to pursue an income redistribution policy markedly different from those of other states.

As a result, the really big issues regarding the

fairness of government taxing and spending in the United States will have to remain federal ones.

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Ohio Economic Trends Review

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Toward an Economic-Topographic Map of Ohio: The Seven Largest Metropolitan Areas / page 1

Philip R. Thompson, a research associate at Cleveland State University's College of Urban Affairs, examines an alternative way of measuring a state's hospitality to economic development. This innovative approach departs from traditional measures by focusing on local economic activity within the state and by breaking this activity into a series of broad occupational-functional roles that are common to all industries.

This first reporting of the occupational-functional profiles of the seven largest metropolitan areas in Ohio is intended to set the stage for a follow-up article, scheduled to appear in the *Ohio Economic Trends Review*.

Profile of the Cleveland Economy / page 23

Although Cleveland has been hard-hit by declines in the manufacturing sector, the city's greatest strength still lies as an exporter of producer durable goods, according to George Williams and Cheryl Bolas, both of the Greater Cleveland Growth Association.

This assessment and others are outlined in their article, the second in a series profiling Ohio's major metropolitan areas. The first article of the series — titled "Transformation of the Akron Economy" — appeared in the Winter 1986 issue.

Recession and Recovery in Ohio's Industries / page 27

Last year, Ohio set a record for the number of persons in the labor force, while experiencing modest gains in total employment and non-farm wage and salary employment. Also in 1985, unemployment continued to decline and industry employment patterns ranged from healthy increases in construction, trade and services, to declines in manufacturing and mining.

Dixie Sommers, director of the State of Ohio's Labor Market Information Division, reviews these job indicators for 1985, comparing the year with 1984. She also discusses the state's job losses and recovery between 1979 and 1985 and examines the effects of Ohio's manufacturing industry structure and national manufacturing employment trends.





Toward an Economic-Topographic Map of Ohio: The Seven Largest Metropolitan Areas

By Philip R. Thompson

The Problem of Measuring Economic Hospitality

The most closely watched, and criticized, index of **business climates** is that of the Alexander Grant Company, which purports to rank states according to their hospitality to economic development. This index has served to provide journalists with eye-catching copy on slow "news days." The newsworthy nature of the copy arises from the fact that there is something for almost everyone: The winners of the state rating contests are delighted to have some "hard" evidence to support their industrial promotion efforts, and the losers are provided with some ammunition to back up their demands for larger industrial development planning budgets, or their arguments for lower taxes and wages.

There are, however, two serious flaws in the Alexander Grant index. First, the state is not a single, indivisible economy: The reasons or consequences to the firm of locating within the Cleveland metropolitan area are considerably different from locating in rural Southeast Ohio. Second, the states ranked highest in their business climate index are those that are in the earlier stages of industrial development. In 1984, Florida was first, South Dakota was second, and Arizona was fifth; while Michigan was last, Ohio was third from the bottom, and Illinois was fifth from the bottom. Those with the lowest scores on this index are the most mature industrial states.

This inverse ranking between industrial maturity and favorability for business should have been a warning to the user. For example, the states ranked according to educational measures (such as earned doctorates in science and engineering at local universities) is generally the reverse of their favorability for economic development, with Michigan having a far better educational system than Florida. One cannot believe that the very processes which lead upward in education lead downward in economic competitive position. Something seems amiss.

The usual fumbling in the first efforts at a single measure of state business climate has been expanded into measures of the position and potential of a **local** economy along **several** alternative, sometimes comple-

mentary, and sometimes sequential paths to economic development and redevelopment. This approach involves breaking local economic activity into a series of broad occupational-functional roles that are common to all industries — rows of comparative advantage that cross the many industry columns.

True, the characteristics that an electronics firm is seeking in an area are likely to be quite different from those of a steel-maker. But so too the **headquarters** of an electronics corporation may have locational preferences more in common with the **headquarters** of an automotive parts producer than either does with its own plants, or even laboratories. When a firm begins life, all parts of it are likely to be located in the same place, but once its success is established, and especially when it attains large size, the various functions and occupations within the firm tend to be performed at different locations.

For example, Detroit is the center of the automotive industry and at one time had almost all parts of the automobile industry located within the Detroit metropolitan area. Thus, the inventors of automobiles and their improvements gave birth nearby to the early entrepreneurs, who in turn were the forebears of the headquarters of the automobile corporations that watched over the production of the automobiles themselves. Today, the Detroit metropolitan area still has the headquarters of the American automobile corporations, and much innovation and entrepreneurship in automobiles still goes on there, but the trend since 1950 has been to vary the location of production, sometimes to where labor costs and taxes are lower, more and more outside the country, and most recently toward a reconcentration to small places in the Midwest and Mid-South.

Therefore, it is useful to identify occupational or functional roles within an industry (the rows across a column of industries). For example, when the worldly-wise Mr. Robinson, in the Hollywood movie *The Graduate*, whispered "plastics" into the ear of Dustin Hoffman, he was giving a tip on an industry but leaving open the choice of occupation within it. Thus, within the plastics industry the ambitious young man must still weigh the role of technologist, or manager, or entrepreneur: alternative paths of opportunity through the laboratory, or the accounting class, or cheap loft space.

Philip R. Thompson is a research associate for the Urban Economic Development Program at the College of Urban Affairs, Cleveland State University.

When judging the ability of an area to attract industries one should evaluate the local ability to play alternative occupational roles within those industries. At least five distinct roles, or paths of economic development, come to mind that encompass fully and group conveniently the scores of occupational classifications of the Bureau of the Census:

- Entrepreneurship, capturing the propensity to start new businesses;
- Central administration, performing the headquarters function;
- Research and development, serving as a center of science and technology;
- Precision operations, focusing on industries that employ more craftsmen and technicians; and
- Routine operations, ranging across manufacturing, trade and services.

These five broad "occupational-functional" classes are intended to be exhaustive in coverage but not at all mutually exclusive or independent of each other. As work progresses, alternative sets of sub-classes should emerge within these five broad groupings to address different policy issues, e.g., disaggregating "precision workers" into blue-collar trades (e.g., tool and die-makers), white-collar work (e.g., accounting and marketing), and "white coat" skills (e.g., medical laboratory technicians). Similarly, research and development by its very title suggests a natural division, one which the Census data supports with separate counts of scientists and engineers. Finally, combining entrepreneurial creativity with financial risk-taking — innovators with venture capitalists — may blur two distinct roles and personalities.

Thus, for routine operations, the Alexander Grant Company may be an adequate index, but for the role of research and development center, where educational levels and insitutions are of considerable importance, the Alexander Grant Company index of state business climates is clearly inadequate, even perverse.

These roles correspond roughly to the major occupational classifications used by the Bureau of the Census. Routine operations corresponds to the occupation "operators, fabricators and laborers," precision operations corresponds to the occupation "precision production, craftsmen and repair," research and development corresponds to "professional specialty occupations," and central administration corresponds to the occupational classification "executive, administrative and managerial." "Entrepreneur" is not an occupational classification used by the Census, so our indexes had to reach beyond Census data on self-employment into magazines such as *Inc.* and *Venture*.

It is possible for local economies to shift between industries, or re-industrialize, by exploiting or leveraging their proficiency at a given occupation. This abstract thesis may be made vivid through using individual case histories. For example, the current president of Apple

Computer, John Sculley, is the former president of Pepsi Cola and was hired by Apple for his management and marketing skills rather than for his knowledge of computers, the personal equivalent of the horizontal move of a place using its headquarters skills to cross industry columns. Consider, for example, corporate mergers and acquisitions that carry places with them into new industrial cultures, e.g., General Motors acquisition of Electronic Data Systems is a shift from automotive manufacturing into electronics.

Alternatively, a person or a place could shift occupations within a given industry through upward mobility. For example, Alfred Hitchcock began his career in the movie industry by putting titles and credits on movies (routine operations). He proved so adept at this he was promoted and assumed more technical duties in film production (precision operations), and from there he innovated new techniques of filmmaking such as better camera angles and backlighting (research and development). After that he directed movies (management), and finally he could attract investors and produce his own movies (entrepreneurship).

"When judging the ability of an area to attract industries one should evaluate the local ability to play alternative occupational roles within those industries."

Metropolitan areas can move along occupational rows and across industry columns (and vice versa) in much the same way as individuals. Most Midwestern manufacturing areas are being forced by low-wage foreign labor to move upward from routine to precision work, and will soon need to reach more into research or management to remain competitive in a given industry. Much of the wealth made in Boston during its golden age of textile, paper and shoe manufacturing was transferred to foundations or into endowments for local universities. As a result, when these old industries faltered, Boston could evolve into a center of research and development. One of the rich legacies of profitable steel and automaking is the strong higher educational system across the Midwest and significant foundation assets per capita. Flint has the highest foundation assets per capita among the 72 largest metropolitan areas; Pittsburgh is 5th; Cleveland is 15th; and Youngstown is midpoint, i.e., 36th.

In addition to the single-industry, single-occupational role limitation of the Alexander Grant index, the state is not a single, indivisible economic unit. The unit of analysis being used in the database is the metropolitan area.

Metropolitan areas are appropriate because they are natural local labor markets. Those who **work** within a given metropolitan area also usually **live** within the same area, and those who **live** within a given metropolitan area can usually commute to **work** offered almost anywhere within that area, a characteristic not true of municipalities or states.

Given fully five economic development paths, how does one go about measuring a metropolitan area's strengths and weaknesses on them? There were 318 metropolitan areas defined by the Bureau of the Census in 1980. These varied in size from the New York Standard Consolidated Area of about 16 million people to the Midland, Texas, metropolitan area of about 83,000. For the purpose of building an index of economic development along five alternative paths, comparing so wide a range of metropolitan areas seems no more defensible than comparing the 48 contiguous states.

The database assumes that metropolitan areas of more than one million population play different roles in the national economy than those of medium-large size, for example, between one-half million and one million population. The size of hinterlands (that is, the non-urban areas surrounding the metropolitan areas), density, costs of production, and other locational determinants differ enough to require comparing a place to its population peer group. For the 32 metropolitan areas of more than one million population, the largest member (New York SCA) is about 16 times the size of the smallest member (Sacramento). For the 40 metropolitan areas with between one-half and one million population, the ratio is two to one. The two size classes have been combined for correlational analysis. While the 16 to 1 ratio of largest to smallest metropolitan area in the more than one million population size class is bothersome, a ratio which increases to 32 to 1 in the statistical analysis, it is still better than the 193 to 1 ratio that would be obtained if all 318 metropolitan areas were treated equally.

The five-path indexes are defined and their sources given below. The rationale behind these indexes can be found in other papers (Thompson & Thompson, 1983, 1984, 1985, 1986a,b,c).

Indexes of Metropolitan Area Comparative Advantage

There were 32 areas of more than one million population in 1980, of which 14 were SCAs and 18 were SMSAs not in SCAs. There were 40 SMSAs with between one-half and one million population in 1980. For the larger size class, Standard Consolidated Areas were used (so the Cleveland SCA also contains Akron). The SMSAs of less than one million population were **not** included with the 16 SCAs to which some of them belonged for the smaller size class. Therefore, Akron is here considered without Cleveland.

A metropolitan area is assigned a rank for each index

(first rank will always mean most favorable for economic development, e.g., the lowest work stoppage rate or the highest percent of college graduates). By inspecting the ranks of many locational factors, an indication of the favorability of a given metropolitan area for each economic development path may be obtained. This procedure readily lends itself (perhaps too well) to lists: first-best metropolitan area for research and development; second-best metropolitan area for headquarters work; third-best metropolitan area for precision operations; and all other combinations.

There is no single summary number for each path, because not all locational indexes are of equal weight, because paths have subdivisions within them, and because a profile conveys more information than a list of numbers. These indexes are presented as a graph so the profile can be seen visually as well as described analytically. One can gauge the strengths and weaknesses of a metropolitan area at a glance by observing the pattern of the arrows on each of the five scales. The Cleveland metropolitan area is profiled in Figure 1. The indexes are listed under their respective paths in Appendix I.

Its profile can be generalized as follows:

- well below average in routine operations;
- above average in precision operations;
- well below average in research and development;
- well above average in central administration; and
- below average in entrepreneurship.

Often a metropolitan area will exhibit a high scatter of arrows on a given path, probably indicating that the function has been defined too broadly; that is, it has within it two or more distinct sub-classes in which the locality has different positions. For example, a metropolitan area might have a weak position in creativity but much-available risk capital (both are kinds of entrepreneurship) or strength in manufacturing corporate headquarters but weakness in service industries (kinds of administration).

The most elusive of the five economic development paths to measure is entrepreneurship, the beginning of the economic development cycle. In other papers (Thompson, P. R., 1985, 1986a,b) it is argued that entrepreneurs constitute a distinct personality type, one which is shared with others in creative occupations (such as actors or painters) and which is distinctively different from personality types in other business occupations (such as managers). Therefore, the entrepreneurship indexes range across the percent employed as authors and designers (the creative), the percent self-employed, and the percent of small businesses, as well as measures of venture capital and fast-growing companies.

The Cleveland metropolitan area is about average for the four non-Census indexes of business entrepreneurship: venture capital per capita 1982-84; employees of *Venture* "fast-track" companies per capita 1982-84; employees of *Inc.* "fast-growth" companies per capita 1981-84;



and employees of the *Inc.* private 500 companies per capita 1984 (the ranks 13, 21, 22, and 14 average to 17.5). On the other hand, Cleveland is below average for the two measures of creativity (percent authors, rank 25, and percent designers, rank 21). It is also below average for measures of "proprietorship," such as self-employment (total, rank 30; female, rank 31; black, rank 24); percent of manufacturing establishments with fewer than 20 employees (rank 22); and the percent of business service employees who work in firms with 1-4 employees (rank 16).

Its highest measures are correlates of its strength in corporate headquarters: percent working in advertising (rank 13) and percent of managers working in marketing, advertising and public relations (rank 6-7). These are included because new, small firms need advertising to overcome the advantages of product familiarity possessed by their larger, established competitors.

The different performance of Cleveland on business entrepreneurship, non-business creativity and proprietorship is maintained across the entire population of 72 metropolitan areas. There are no significant correlations between non-business creativity and either entrepreneurship or proprietorship. Only minor correlations are exhibited between entrepreneurship and proprietorship. The strongest correlations for this path were between percent authors, percent designers and metropolitan area population (50 percent explained variance), suggesting that these occupations require either the cultural diversity or economies of scale of large metropolitan areas, or both. These results reinforce the hypothesis of subdivisions within the five broad paths.

Cleveland's strongest path is central administration. Here the natural division is between manufacturing and service industries. For the industrial *Fortune* 500 (rank 4) and 2nd 500 (rank 2), and the percent of manufacturing employees working in central administrative offices (rank 6), Cleveland is above average. The *Fortune* measures are designed to reflect headquarters power and are expressed as a ratio of the worldwide employees of the corporation to the 1980 population of the metropolitan area within which the corporation headquarters resides. The percent of manufacturing employees in central administrative offices is intended to reflect headquarters employment.

National advertising agencies rose with national manufacturers, since only the latter can afford national advertising (retail advertising is usually done in-house). Cleveland ranks 13th in the percent of the employed working in advertising and 6-7th in the percent of managers working in marketing, advertising and public relations.

Cleveland is 7th and 9th, respectively, in foundation expenditures and foundation assets per capita, probably a reflection of the past accumulation of resident wealth in steel and other heavy manufacturing. By contrast, Columbus ranks only 24th in foundation assets per capita and Sacramento is last.

Cleveland is below average in service headquarters, e.g., the *Fortune* Service 500 (rank 20) and for the percent

"Indeed, analyzing metropolitan areas is like trying to set a wristwatch using a sundial. The sundial lacks the precision of the wristwatch, but the operation can be performed only one way."

of employed female managers (rank 28). The latter index is used to reflect the extent to which heavy manufacturing has excluded women. For example, although women now buy 40 percent of all automobiles (a statistic projected to increase to 50 percent by 1990) the "Big Three" car companies have no marketing information on how women car buyers differ from men. A first assumption that women want luxury most (Dodge once introduced a two-tone pink car with color-coordinated orchid upholstery) proved false. A marketing survey conducted by the publisher of *Vogue* found that women rate dependability and economy first and second, respectively (*Newsweek*, March 24, 1986, p. 54). A female executive might have been able to tell them that immediately.

Total aircraft departures is a measure of ease of travel for executives. Net export of enplaned passengers is a measure of the extent to which Cleveland is an air service hub. It is defined as the total enplaned passengers for the SMSA or SCA minus its expected share $[(1980 \text{ SMSA population} / 1980 \text{ U.S. population}) \times [\text{total enplaned passengers}]]$. This index is **not** correlated significantly with absolute size; Atlanta ranks first.

Other indexes used are the percent of employed blacks who are managers, the percent working in commercial research, management and data processing, and the percent of employed technical writers. Technical writers do not exhibit a correlation with other writers, but rather intercorrelate with commercial research and data processing (56 percent explained variance). The percent of employed blacks who are managers is an attempt to measure the sensitivity of firms to a market for black people. McDonald's, for example, has been very successful using black advertising firms to market its hamburgers to blacks living in urban areas.

Cleveland is well below average for research and development: 24th rank in R&D dollars per capita in local colleges and universities; 26th in the percent of employed natural scientists; 27th in its percent of college graduates among those 25 and older; and 27th in the per capita number of Ph.D.s awarded in science and engineering between 1975 and 1980. The relatively higher ranks of doctoral scientists per capita (15th rank) and scientists and engineers working in business per capita (11th rank) may be due to the age of the National Science Foundation



data (1974-75). The trend for Cleveland in R&D from 1970 to 1980 has been downward; in 1970 Cleveland was above average for this path.

Cleveland's above average performance in precision operations is in part a reflection of weakness in routine operations — its loss of unskilled jobs. For example, it is likely that its low quit-rate in manufacturing (rank 6) is due in large part to the weak job market for the unskilled. Its percent of owner-occupied housing (rank 10) is an index of loyalty to a metropolitan area. Since quit-rate and homeowners are not significantly correlated for the 72 metropolitan areas, their effects can be considered additive.

The other indexes reveal greater strength with increasing precision in the measurement. Thus, Cleveland is 22nd in the ratio of "precision production, craftsmen and repair" occupations to "operators, fabricators and laborers"; 21st in the percent of technologists and technicians (except health) within the employed; 15-16th in the percent of engineers within the employed as given in the 1980 Census of Population; and 11th in the National Science Foundation survey of scientists and engineers working in business. It is average in its percent of high-school graduates among those over 25 (rank 19).

'Policy-making requires that the work extend to the state level by analyzing the urban system within the state, where measurements can be more precise.'

For routine operations, Cleveland's position is below average. It is average as a place to live for a family with a low budget (rank 15); its wages are high for clerical work in non-manufacturing (rank 22) and higher for unskilled plant manufacturing pay (rank 30-31); and for the percent of time lost due to work stoppages it is 31st of 32. Its rate of female labor force participation is 23rd (so there are relatively few families with two wage earners) and its average hourly earnings in manufacturing are 26th.

For comparison, the profiles of the other six Ohio metropolitan areas are given in Figures 2-7. The trends from 1970 to 1980 (expressed in terms of net change in ranks) are given in Figures 8-14. It is not possible to give rank changes for all 1980 indexes, since many measures did not exist in 1970. It is also not possible to give as many indexes for smaller metropolitan areas as for larger ones. For example, below one million population the *Venture and Inc.* measures become zero for all but a few metropolitan areas. When a rank is available it is given; if the data are not available for the index, or would merely be an

average of many zeros, they are omitted.

Economic-Topographic Profile of Ohio

The metropolitan area, defined as the job commuting radius that bounds the local labor market, is a close approximation of the local economy. But it is not a unit of government. There is a glaring lack of effective metropolitan area government in the United States. Even the exceptions to the rule — city-county consolidations — usually lag events; most of the new suburban growth is in contiguous counties beyond the reach of the new "metropolitan area government" by the time it takes effect. The only exception to this rule is chance geography of the tiny State of Rhode Island, where 97 percent of the state's population is located in the Providence-Warwick-Pawtucket metropolitan area. In general, when a metropolitan area analysis is finished, there is just no one to hand it to.

Indeed, analyzing metropolitan areas is like trying to set a wristwatch using a sundial. The sundial lacks the precision of the wristwatch, but the operation can be performed only one way. Policy-making requires that the work extend to the state level by analyzing the urban system within the state, where measurements can be more precise. It is the state which bears responsibility for arranging the economic furniture within its own house. The distribution of funds for state universities — especially graduate programs in science and engineering — has become the critical variable in the geographic distribution of employment in research and development. Columbus may lack significant foundations, but it has captured a very disproportionate share of the state's higher education budget.

Similarly, state transportation policy, planning and public works build hubs and networks that sometimes create new centers and affect the competitive position of those places not chosen. These, in turn, nurture headquarters roles in some cities rather than others. Those who allocate state funds for higher education and transportation have more control over the settlement pattern of the state for the decades to come than they know or perhaps welcome.

The charts that accompany this article are intended, collectively, to be a first draft of an economic-topographic map of Ohio that roughly sketches the occupational-functional peaks and valleys of the state, serving as a guide to the official path-finders in state economic development policy-making and programming. The reasoning has now come full circle: After beginning by rejecting the state as a true local economy in measurement and diagnosis, the **political-economy** critical to prescription requires us to look to the state.



First Impression of the Terrain

For routine operations, only Columbus and Cincinnati show an even average performance, reflecting their lower wage rates; and Cincinnati alone has not experienced rising relative wage rates. Therefore, Ohio should probably expect to experience continued decline in competitive position as a site for routine operations, as unskilled work moves south in the United States and out of the country. The rise of seven ranks in the competitive position of Akron on the index "unskilled plant pay in manufacturing" (coupled with a decrease of four ranks on the index "average hourly earnings in manufacturing" and a decrease of eight ranks in "percent of working time lost to stoppages") probably illustrates this conclusion. Jobs in Akron for less-skilled workers have apparently become increasingly lower-paying, non-union jobs.

"One of the challenges of future economic development in Ohio will be to follow the lead of the industrial East by identifying determinants of entrepreneurship and to develop policies for promoting entrepreneurs within Ohio."

For precision operations, only Youngstown rated below average and only Youngstown lost ground from 1970 to 1980. Therefore, it appears that Ohio shows statewide strength in precision operations. The improvement may follow partly from the state's heavy loss of routine manufacturing operations and the low quit-rate of skilled workers.

For R&D, the results are mixed. The location of the state's largest university in Columbus has created a strong center. The other strong center (Dayton) is largely the effect of Wright-Patterson Air Base. Akron and Cincinnati are average performers. Cleveland and Toledo are below average, with Youngstown very low. This may be related to the statewide trend toward improvement in competitive position for precision operations. Ted Hiser (former assistant dean in the College of Urban Affairs at Cleveland State University) offered four reasons to explain the gain in competitive position of Cleveland for precision operations and the loss in position for R&D:

- The State of Ohio spent its educational budget from 1970 to 1980 creating new four-year undergraduate colleges and community colleges, rather than creating new graduate programs;
- Cleveland lacked a top-ten research university during the peak funding years for federal science grants;

- There was a general population shift from the Frostbelt to the Sunbelt, therefore a relative increase in undergraduate and graduate enrollment in states competitive with Ohio; and
- Oil-rich states such as Texas could, in the 1970s, lure Nobel Prize-winning professors to their state universities with richly endowed chairs.

The emphasis on undergraduate (rather than research-doctorate) programs, which the State of Ohio maintained from 1970 to 1980, may therefore explain both some of the improvement in two precision manufacturing indexes (the percent of the employed who are technologists and technicians, and the ratio of skilled to semi-skilled and unskilled workers) together with the slippage in the R&D indexes.

In the headquarters role, three metropolitan areas (Akron, Cleveland and Dayton) are strong; Cincinnati is average; two are bi-modal (Columbus and Toledo show distinct clusters for each *Fortune* 500 index); and only Youngstown is below average. From 1970 to 1980, Akron and Cleveland held their above average rank, while Cincinnati, Columbus, Dayton and Toledo actually improved their positions. Only Youngstown lost ground. Therefore, headquarters work is a promising economic development path across much of Ohio.

Robert Premus, economics professor at Wright State University, suggested that for many established middle-size corporations and for existing branch headquarters of *Fortune* 500 corporations, Dayton is losing ground in the central administration path. Nevertheless, it is net flows that are important. What headquarters moved into Dayton at the same time?

For entrepreneurship, only Dayton rates an above average performance, with Youngstown showing strength in small business. Youngstown may be exhibiting much involuntary self-employment: Since Youngstown is below average on all other economic development paths, what else is there to do after being let go but leave Youngstown or try to employ oneself? Moreover, Youngstown is increasing its score only in service self-employment, not manufacturing self-employment. From 1970 to 1980, only Dayton had an average performance in entrepreneurship and held onto that position.

The Ohio pattern resembles much of the industrial Midwest, but **not** the industrial East. The region centered around New York scores above average on the indexes of entrepreneurship. These elevated scores reach south to Philadelphia, and westward to somewhere between Philadelphia and Pittsburgh. Therefore, unlike routine manufacturing operations, the low competitive position of the industrial Midwest on entrepreneurship is **not** a difference between the Frostbelt and the Sunbelt. One of the challenges of future economic development in Ohio will be to follow the lead of the industrial East by identifying determinants of entrepreneurship and to develop policies for promoting entrepreneurs within Ohio (Thompson, P. R., 1985, 1986a,b).



Next Steps

This first reporting of the occupational-functional profiles of the seven largest metropolitan areas in Ohio is intended to set the stage for a follow-up article, scheduled to appear in this journal. The many policy implications of the comparative advantages and disadvantages of various Ohio sub-economies will be explored, as they move along these five broad paths of local economic development. Most important, a second impression may be gained of the Ohio system of cities, as seen from the State Capital, in policy-making perspective.

Author's Note: The conceptual framework upon which this article is based is the creation of Wilbur R. Thompson, Professor Emeritus in the Department of Economics at Wayne State University and Albert A. Levin Professor of Urban Studies and Public Service at the College of Urban Affairs, Cleveland State University. Funding has been provided by a grant from the Northeast Ohio Urban University Fund and the U.S. Economic Development Administration. I thank Anthony Stocks, Barbara Rolleston and Robert Premus for their comments.

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Appendix I

(An unabbreviated listing of the indexes by economic development path as used in the charts that accompany this article.)

Entrepreneurship

- Venture "fast-track" 100, 1982-84 average*
- Venture capital per capita, 1982-84 average
- Inc. "fast-growth" 100, 1981-84 average*
- Inc. private 500, 1984*
- Percent self-employed: total, females, blacks
- Percent of the employed who are authors and the percent who are designers
- Percent of manufacturing establishments with fewer than 20 employees, 1982
- Percent of business service firms with 1-4 employees (1-3 employees in 1967) expressed as a percent of all firms and as an estimated percent of all employees
- Percent of all employed working in advertising
- Percent of managers working in marketing, advertising, public relations

Central Administration

- Fortune 500, 1983*
- Fortune 2nd 500, 1982*
- Fortune service 500, 1983*
- Percent of manufacturing employees working in central administrative offices, 1982 or 1967
- Foundation assets and expenditures per capita, 1980
- Percent of all employed who work in advertising
- Percent of all managers working in marketing, advertising and public relations
- Percent of all employed working in commercial research, management and data processing
- Percent of all employed who are technical writers
- Percent of all employed females who are managers
- Percent of all employed blacks who are managers
- Total aircraft departures in 1981 (for SCAs or SMSAs of more than one million population only)
- Net export of enplaned passengers, 1982 (the total enplaned passengers of the SCA or SMSA of more than one million population minus its population share of all enplaned passengers)

Research & Development

- Percent of all employed who are natural scientists
- Percent of all employed who are engineers
- Percent of those 25 years and older with four or more years of college
- Per capita science and engineering doctorates granted within the SCA or SMSA from 1975-80 or 1961-70
- R&D expenditures per capita in 1980 in all colleges and universities within the SCA or SMSA
- Per capita doctoral scientists and engineers in the 1975 National Science Foundation survey using the average of the 1970 and 1980 populations

Precision Operations

- Percent of those 25 years and older who are high-school graduates
- Percent of all employed who are technologists & technicians (except health)
- Percent of all employed who are engineers
- The ratio of precision production, craftsmen and repair workers to operators, fabricators and laborers
- Per capita scientists and engineers employed in business, National Science Foundation Survey of 1974, using an average of the 1970 and 1980 populations
- Percent of all occupied housing which is owner occupied
- Quit-rate in manufacturing, 1979-80 or 1969-71

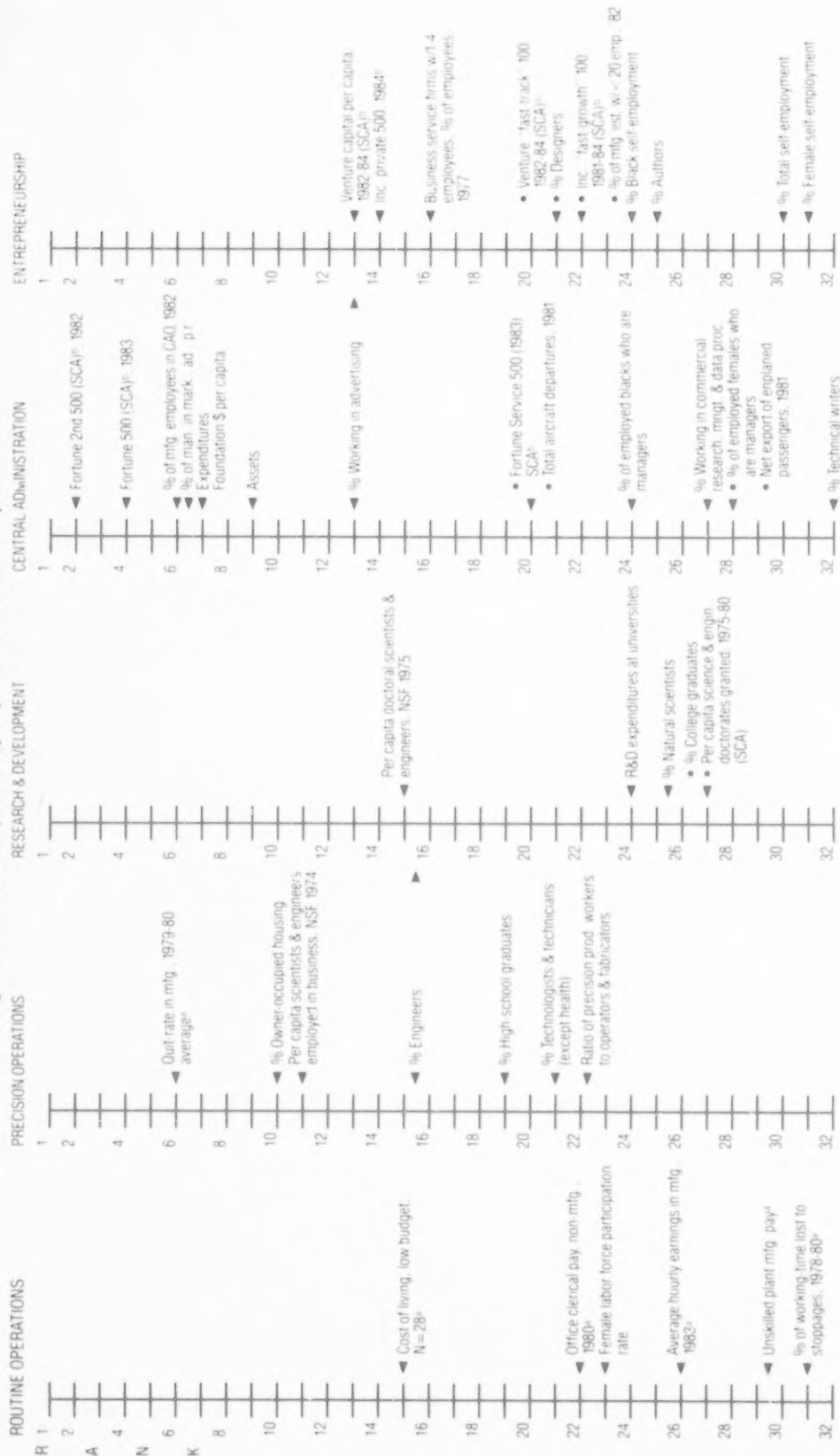
Routine Operations

- Average hourly earnings in manufacturing, 1983
- Unskilled plant manufacturing pay
- Office clerical pay in non-manufacturing
- Female labor force participation
- Percent of all working-time lost to stoppages, 1978-80 or 1969-71
- Cost of living for a low-budget family (available for only 23 SMSAs; rank is made proportional to 32)

*Ratio of worldwide corporate employees to population of SCA or SMSA with corporate headquarters

FIGURE 1:

Comparative Position of the Cleveland Metropolitan Area Among the 32 Largest Metropolitan Areas on Selected Measures Along Five Alternative/Complementary/Sequential Economic Development Paths

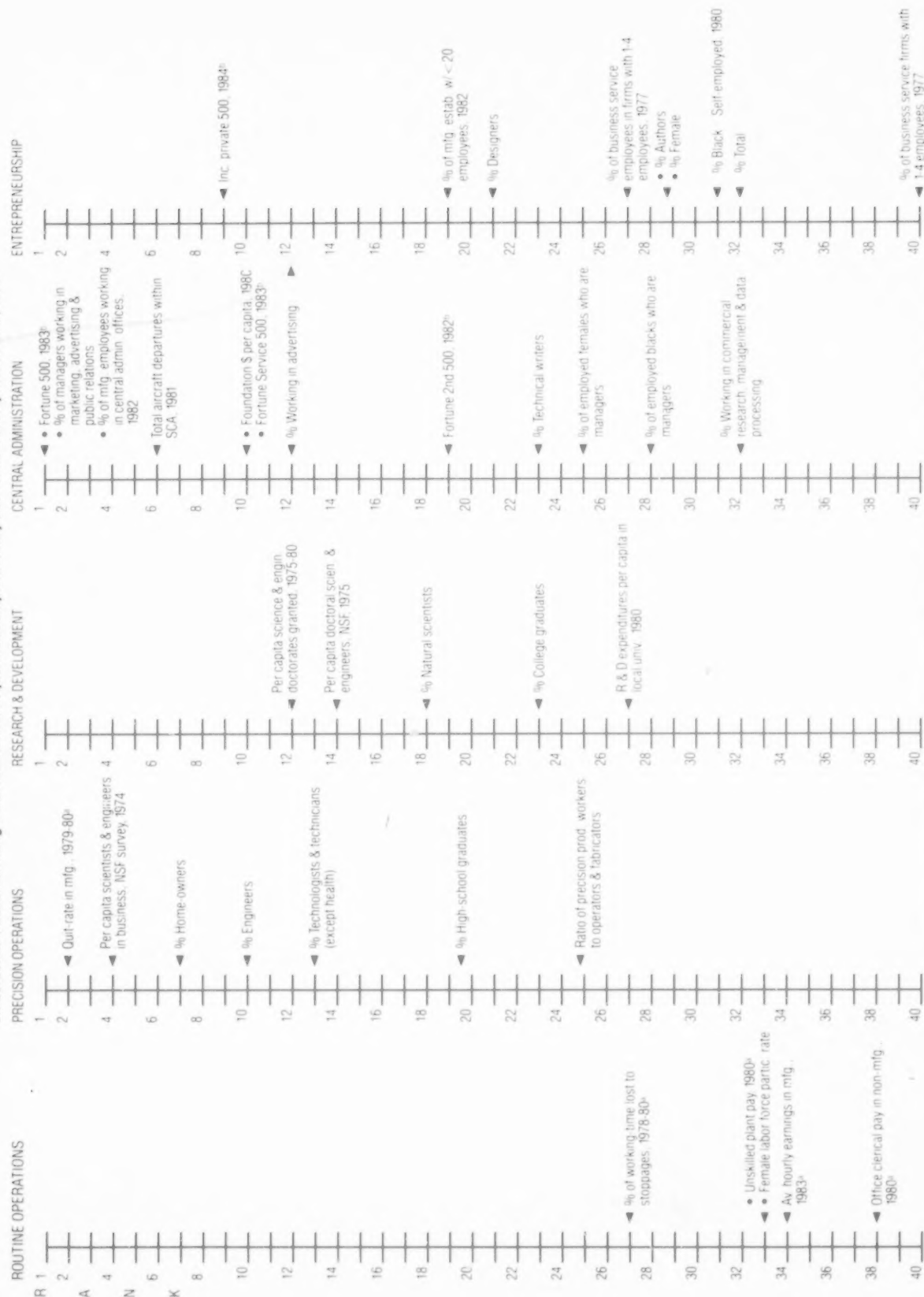


^a Low values carry high rank

^b Ratio of worldwide employees of corporation with local headquarters to local population (1980). Standard Consolidated Area used

FIGURE 2:

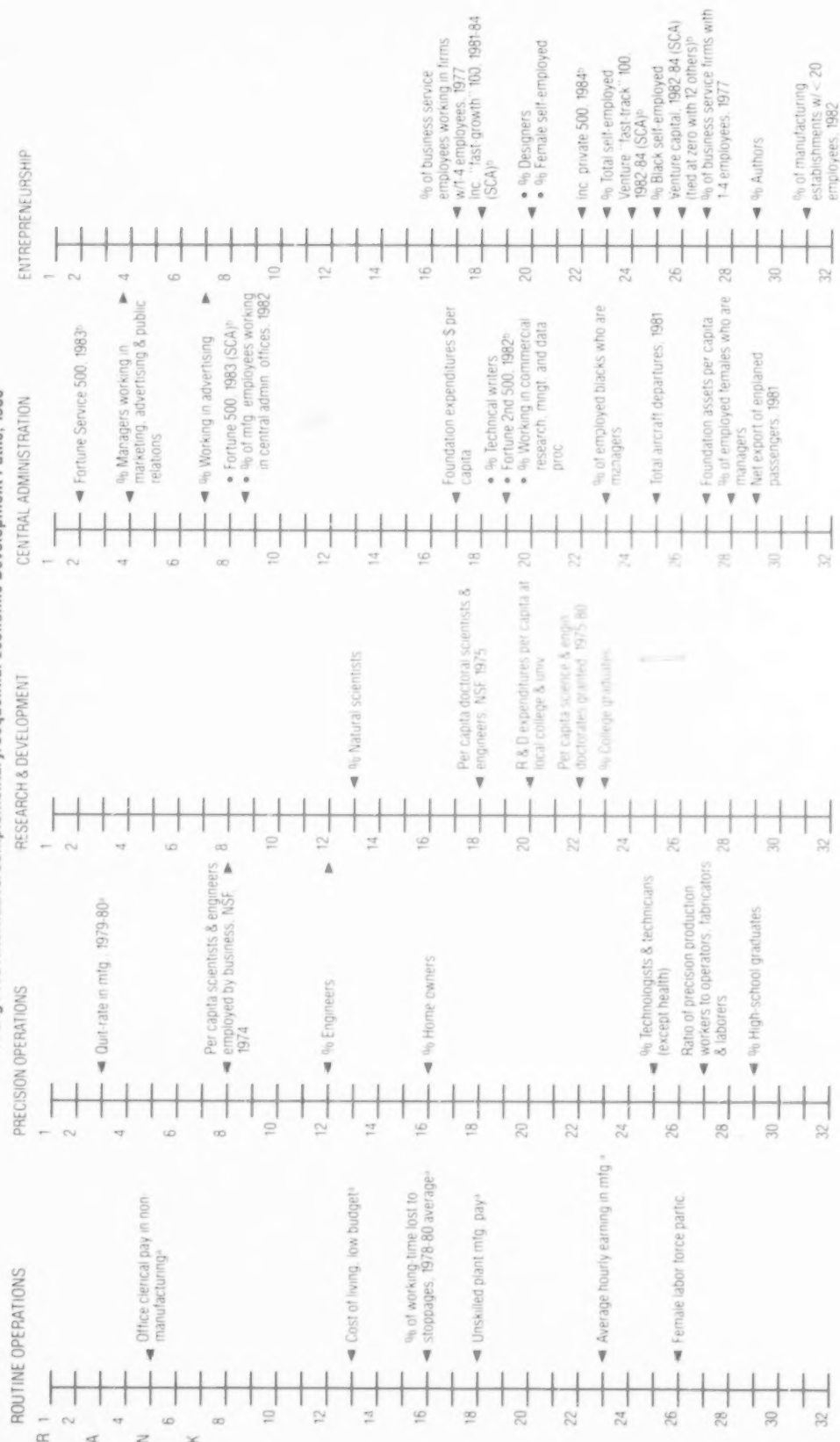
Position of the Akron Metropolitan Area Among the 40 Metropolitan Areas of Between One-Half and One Million Population on Selected Measures Along Five Alternative/Sequential/Complementary Economic Development Paths, 1980



^a Low values carry high rank

^b Ratio of worldwide employees of corporation with local headquarters to local population

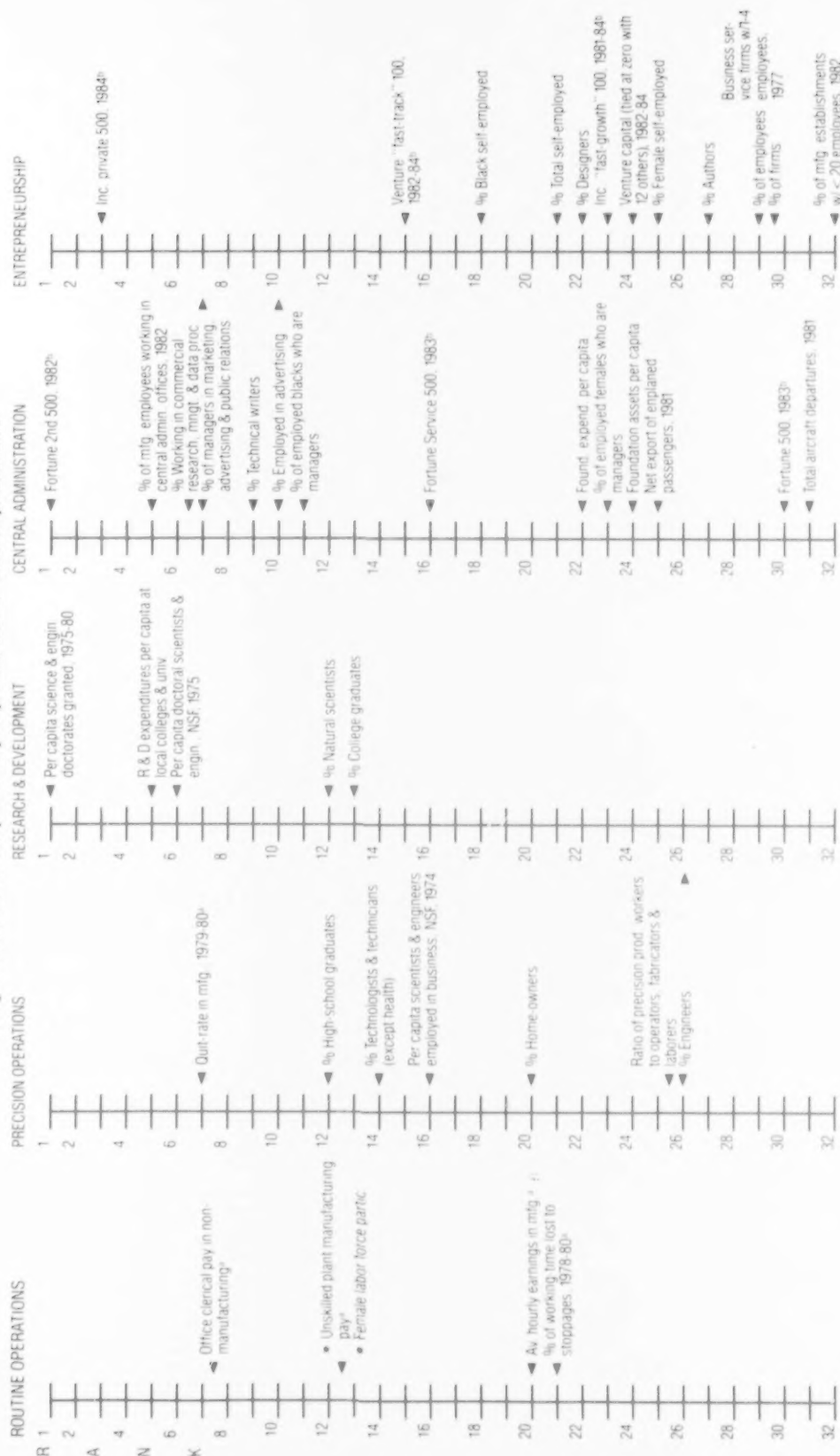
FIGURE 3: Comparative Position of the Cincinnati-Hamilton Metropolitan Area Among the 32 Largest Metropolitan Areas on Selected Measures Along Five Alternative/Complementary/Sequential Economic Development Paths, 1980



^a Low values carry high rank.

^b Ratio of worldwide employees of corporation with local headquarters to local population (1980).

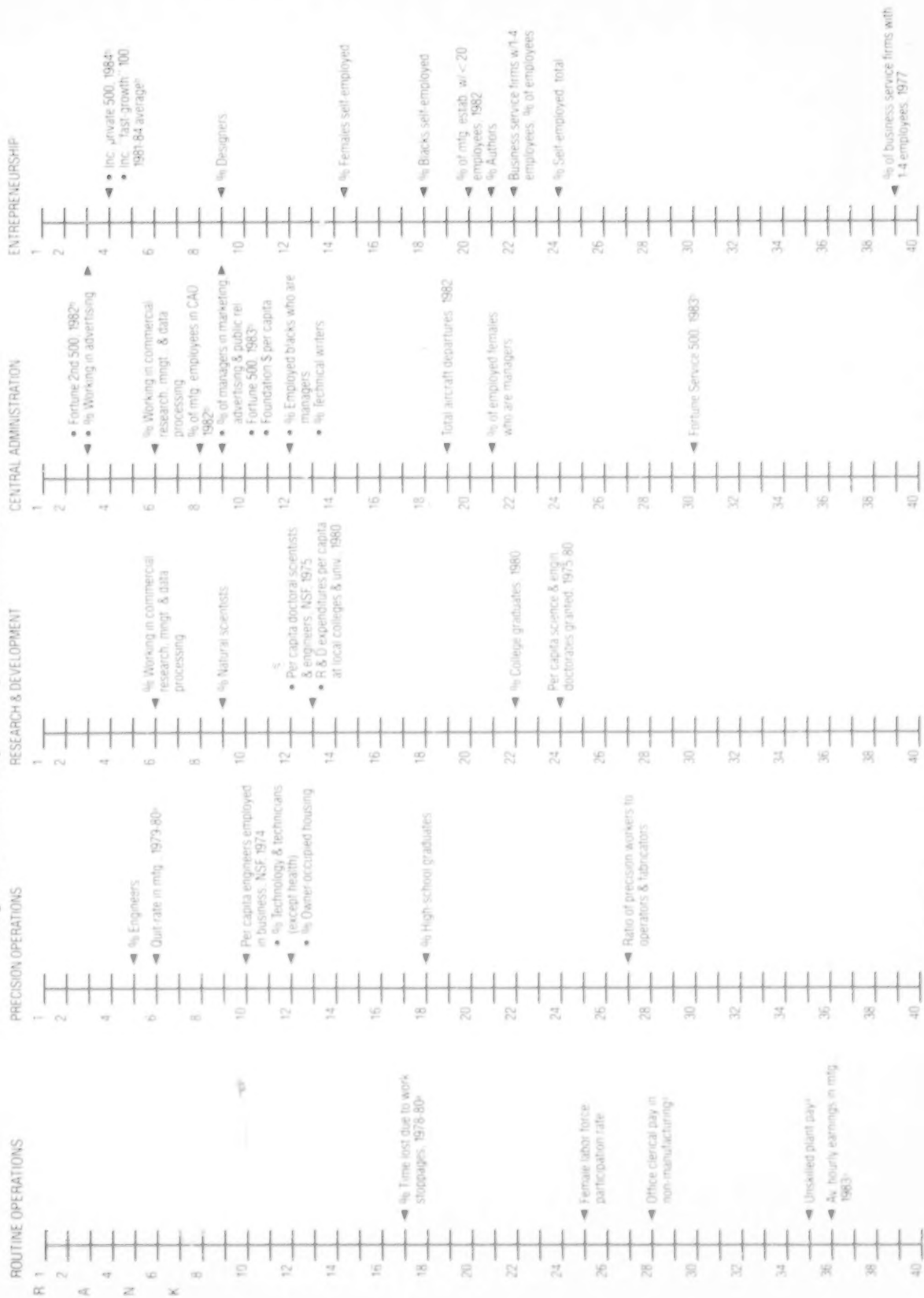
FIGURE 4: Comparative Position of the Columbus Metropolitan Area Among the 32 Largest Metropolitan Areas on Selected Measures Along Five Alternative/Complementary/Sequential Economic Development Paths



^a Line values carry high rank.

^b Ratio of worldwide employees of corporation with local headquarters to local population (1980). Standard Consolidated Areal used.

FIGURE 5: Position of the Dayton Metropolitan Area Among the 40 Metropolitan Areas of Between One-Half and One Million Population on Selected Measures Along Five Alternative/Complementary/Sequential Economic Development Paths, 1980

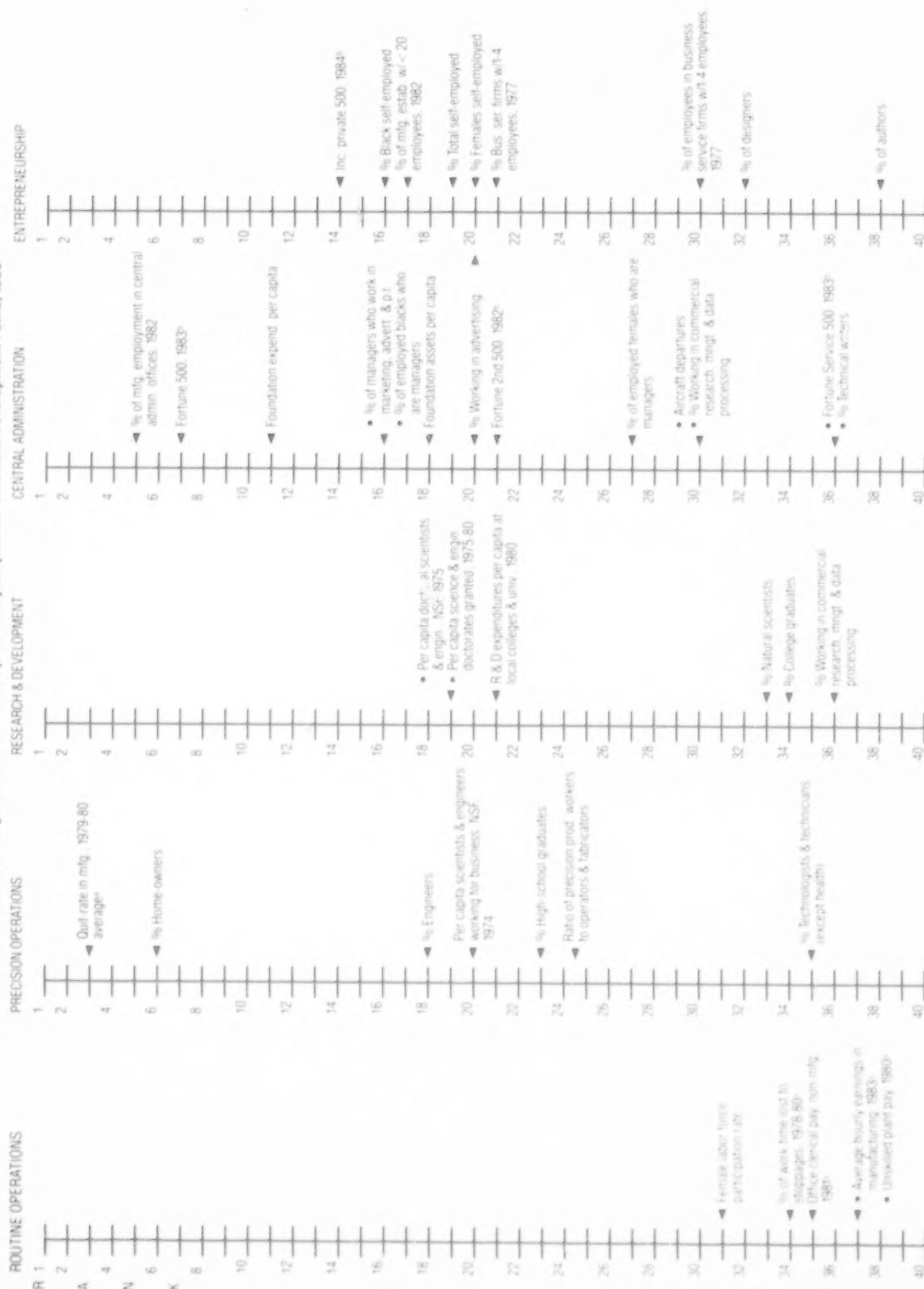


^a Low values carry high rank.

^b Ratio of worldwide employees of corporation with local headquarters to local population (1980). CAO is central administrative offices.

FIGURE 6:

Comparative Position of the Toledo Metropolitan Area Among the 40 Metropolitan Areas of Between One-Half and One Million Population on Selected Measures Along Five Alternative/Complementary/Sequential Economic Development Paths, 1980



^a Low values carry high rank.

^b Ratio of worldwide employment of corporation with local headquarters to local population (1980).

FIGURE 7: Position of the Youngstown Metropolitan Area Among the 40 Metropolitan Areas of Between One-Half and One Million Population Along Five Alternative/Complementary/Sequential Economic Development Paths, 1980

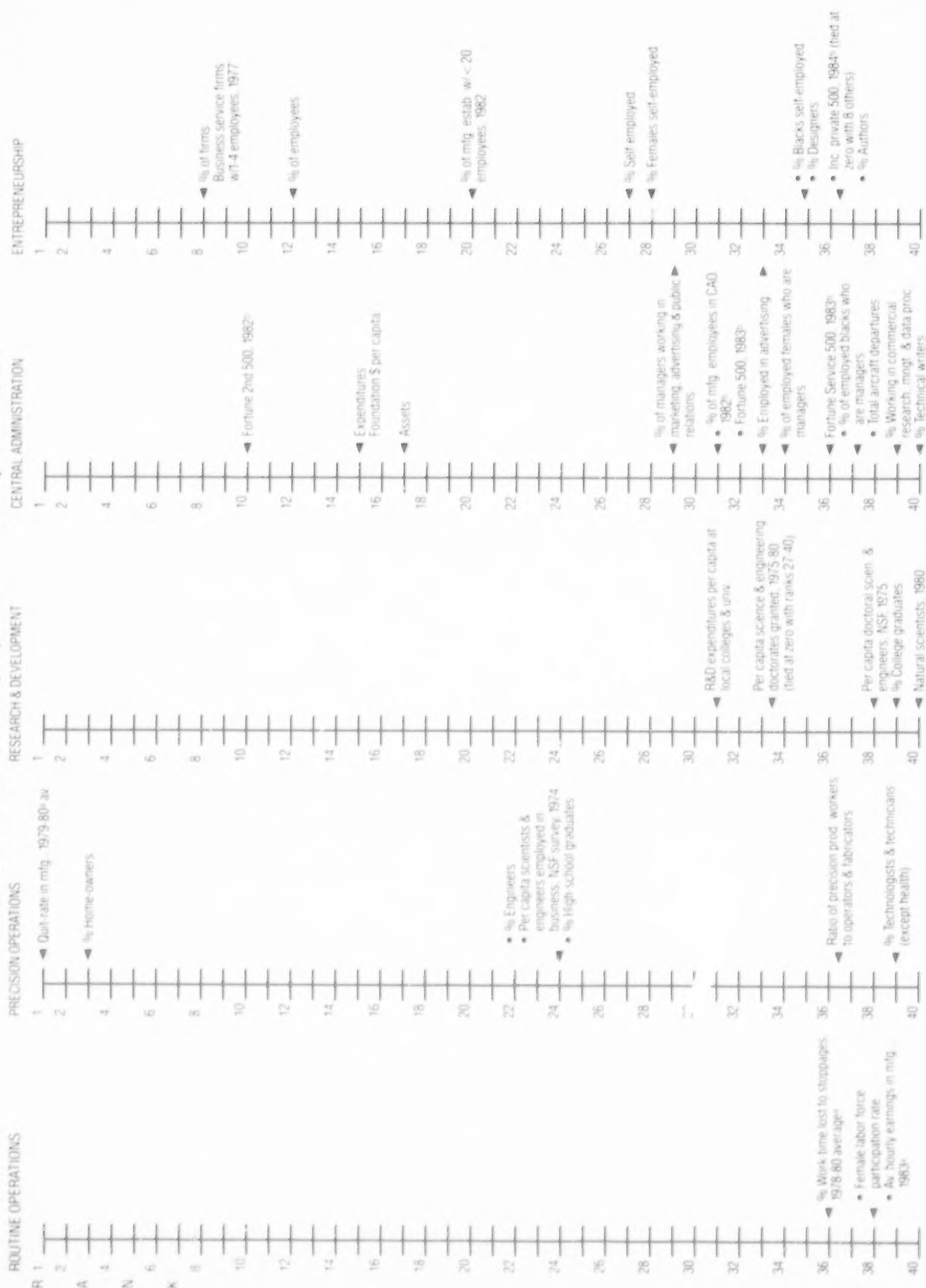


FIGURE 8: Rank Change 1970-80 for the Akron Metropolitan Area Among the 40 Metropolitan Areas Which in 1980 Had Between One-Half and One Million Population Along Five Alternative or Complementary Economic Development Paths

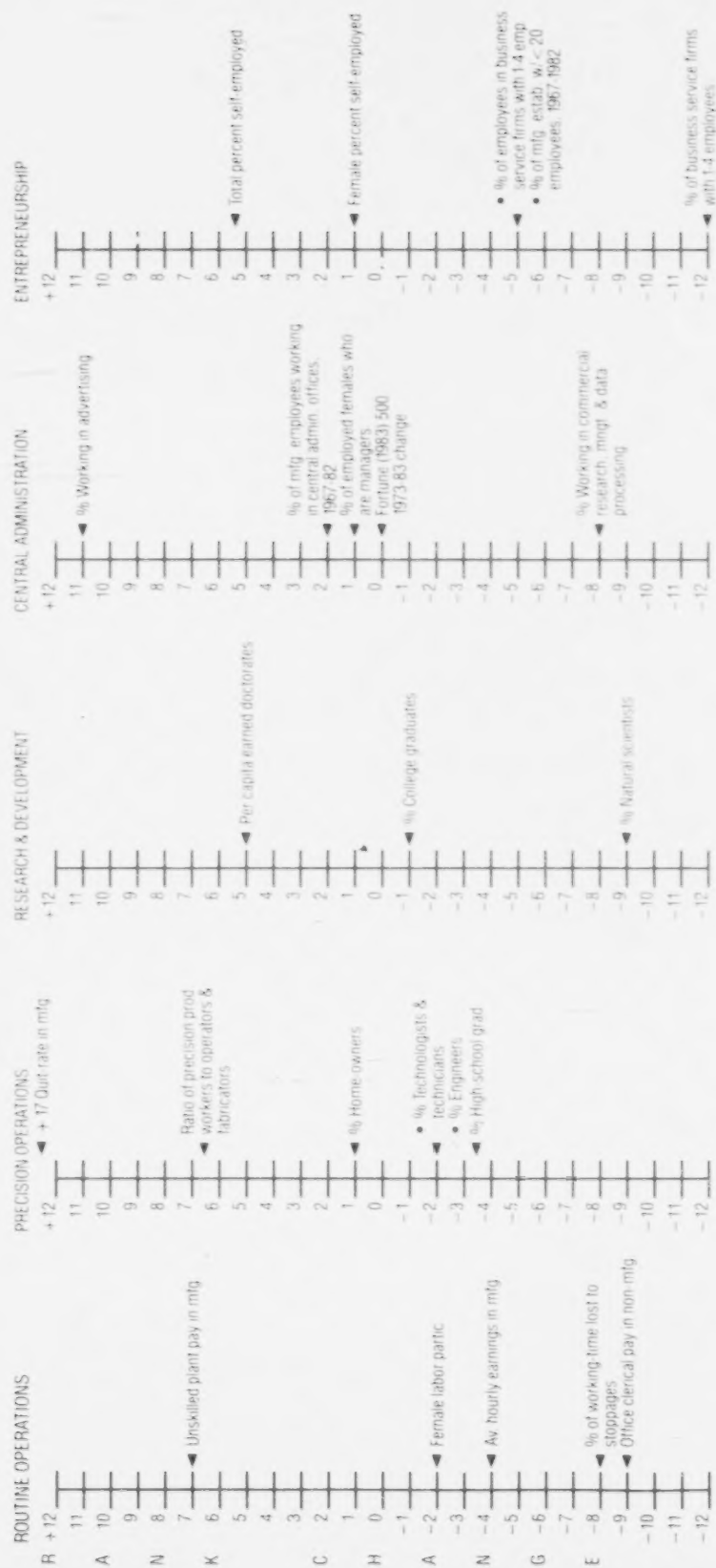
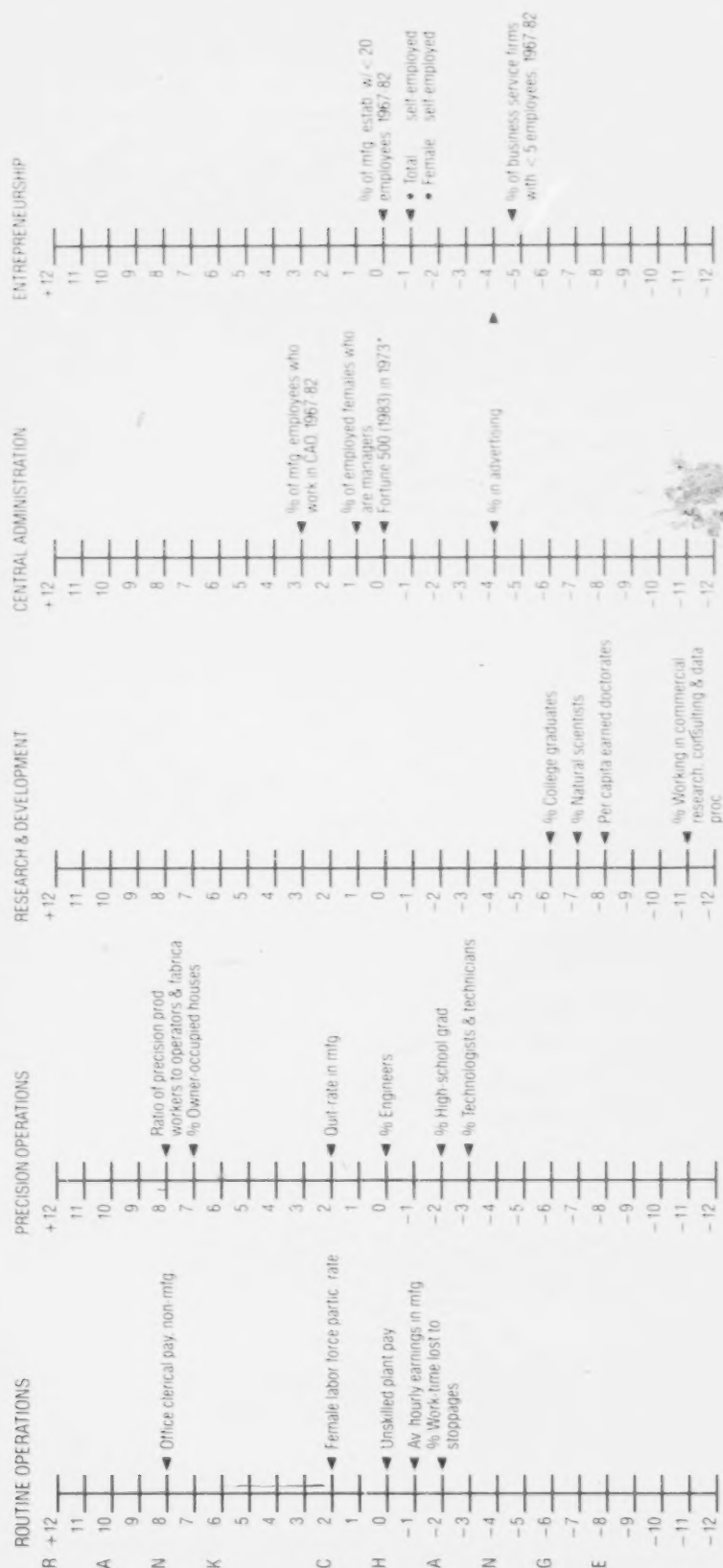


FIGURE 9: Rank Change 1970-80 or 1967-77 for the Cincinnati Metropolitan Area Among the Largest 32 Metropolitan Areas (in 1980)
Along Five Alternative/Complementary/Sequential Economic Development Paths



FIGURE 10: Rank Change 1970-80 for the Cleveland Standard Metropolitan Statistical Area Among the 32 Largest Areas (in 1980)
on Selected Measures Along Five Alternative/Complementary/Sequential Economic Development Paths



*Standard Consolidated Area definition

FIGURE 11: Rank Change 1970-80 for the Columbus Standard Metropolitan Statistical Area Among the 32 Largest Areas (in 1980)
on Selected Measures Along Five Alternative/Complementary/Sequential Economic Development Paths

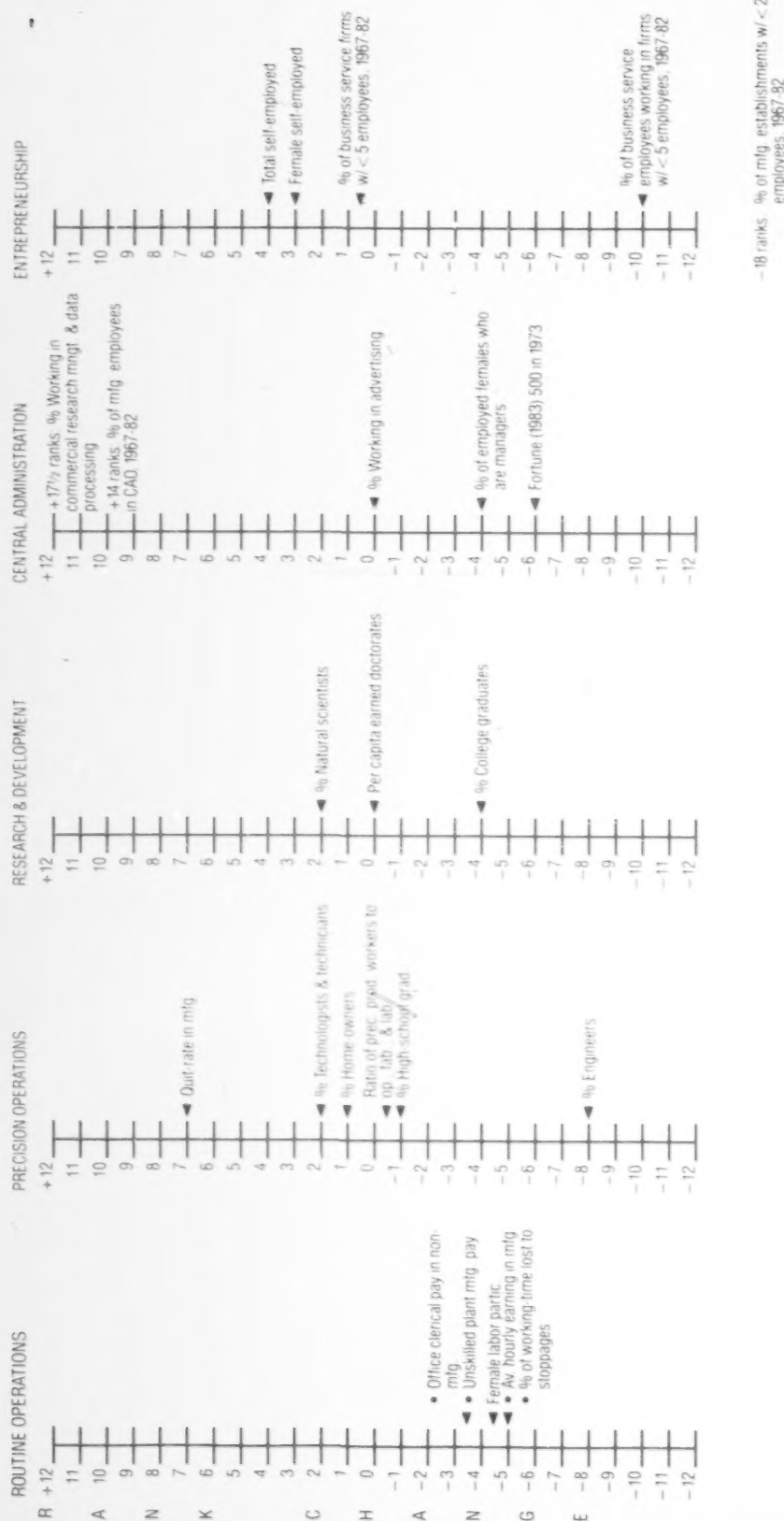


FIGURE 12:

Rank Change 1976-80 for the Dayton Metropolitan Area Among the 40 Metropolitan Areas Which in 1980 Had Between One-Half and One Million Population Along Five Alternative/Complementary/Sequential Economic Development Paths

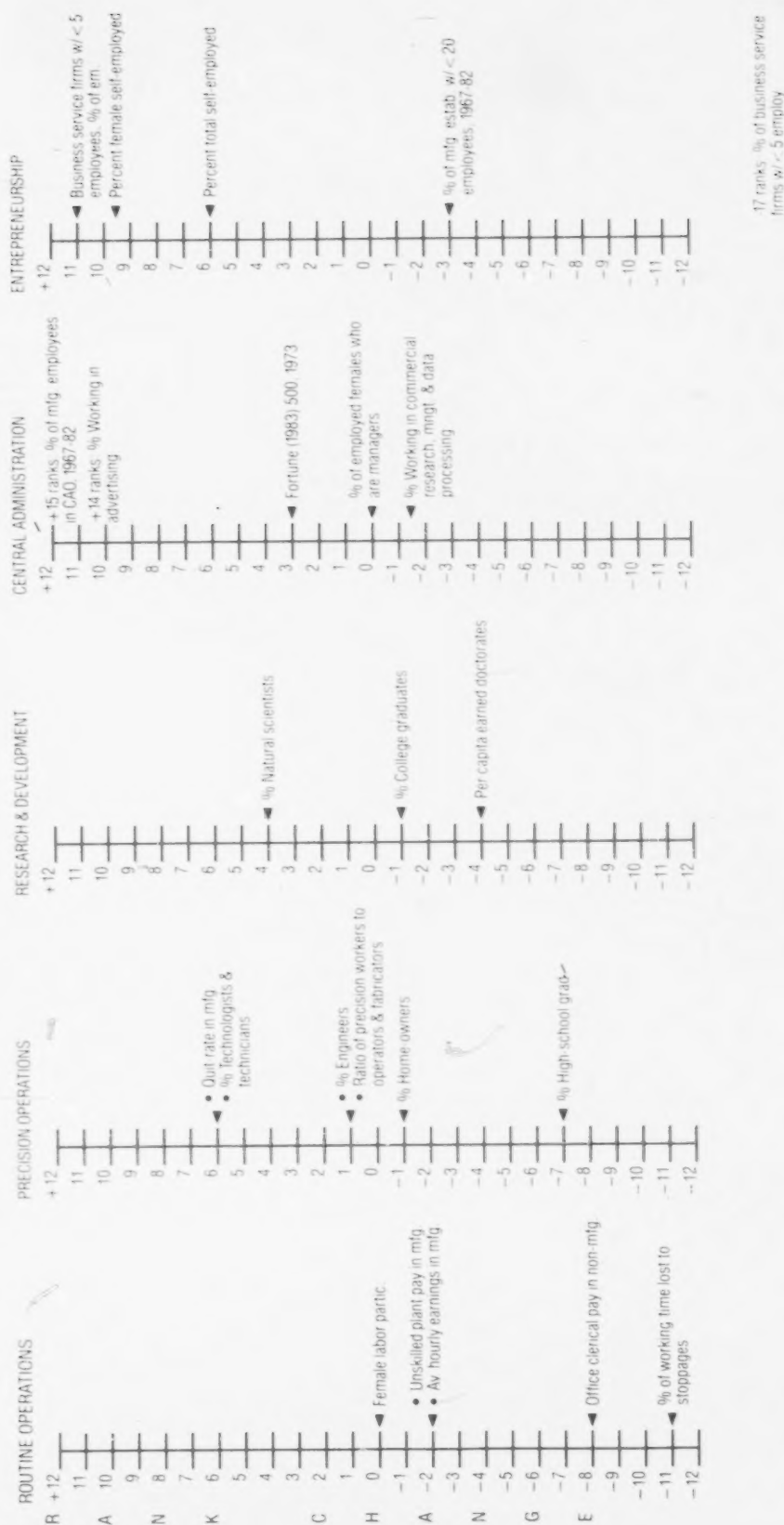


FIGURE 13: Rank Change 1970-80 for the Toledo Metropolitan Area Among the 40 Metropolitan Areas Which in 1980 Had Between One-Half and One Million Population Along Five Alternative/Complementary/Sequential Economic Development Paths

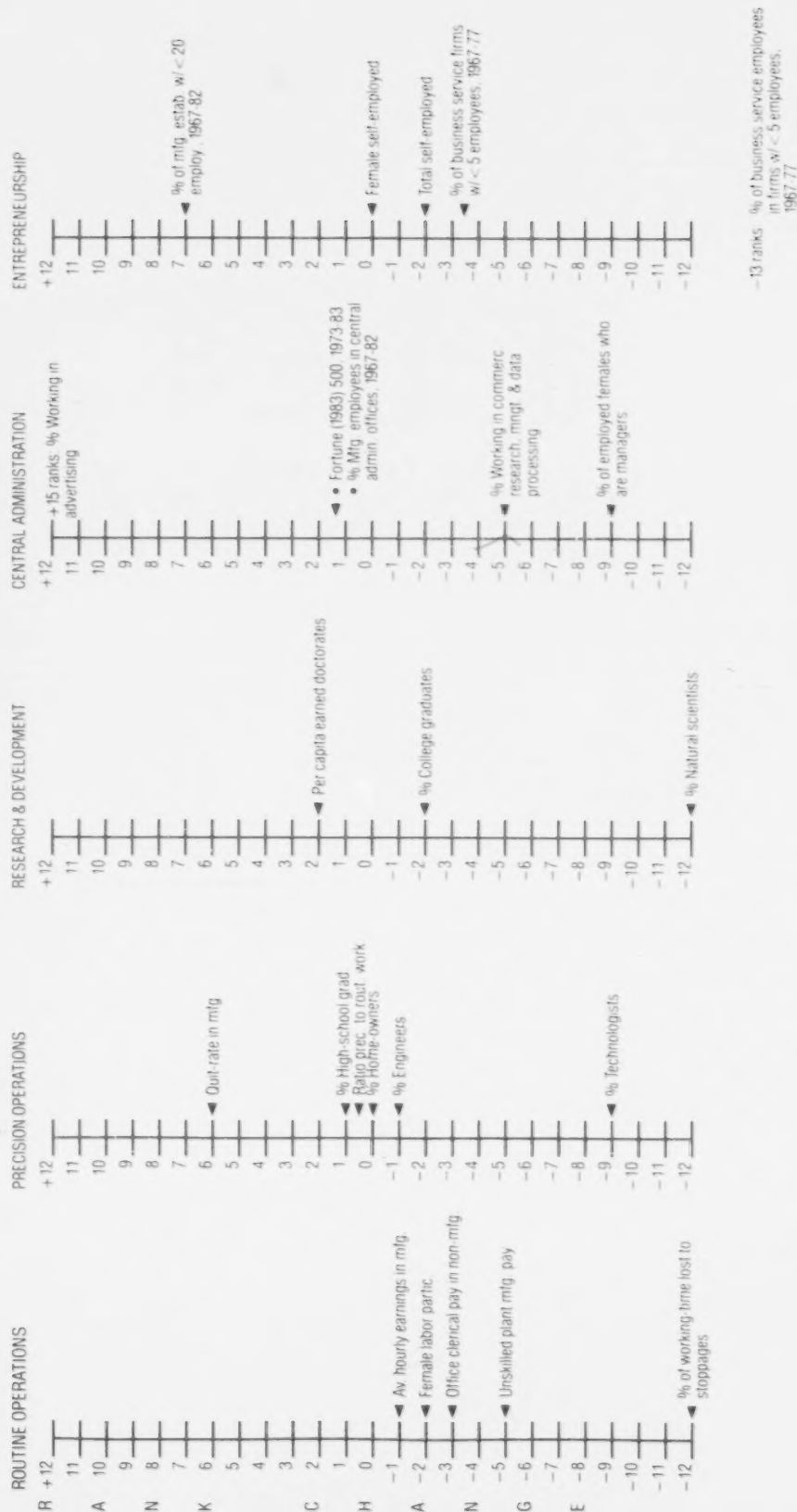


FIGURE 14: Rank Change 1970-80 for the Youngstown Metropolitan Area Among the 40 Metropolitan Areas Which in 1980 Had Between One-Half and One Million Population Along Five Alternative/Complementary/Sequential Economic Development Paths



-16 ranks % Female self employed



Profile of the Cleveland Economy

By George Williams and Cheryl Bolas

The following description of the Cleveland economy is based in large part on the Rand Corporation Base Study of the Cleveland Economy completed in 1982.

Historical Background

The primary factor influencing Cleveland's early economic development was its strategic location to key water routes linking the East to the newly developing Northwest Territory. The opening of the Erie Canal in 1825 linked New York State and the Hudson River with the Great Lakes and brought a new wave of mass migration from Europe to inland America. The Ohio-Erie Canal, constructed in 1831, connected Cleveland with the Ohio River to the south. Consequently, Cleveland found itself in a strategic location on a natural water route, ready to accommodate the large wave of European immigration, the westward movement of the nation's population and the growing industrial development in the Great Lakes region during the latter half of the 19th century. Cleveland built harbor and dock facilities to accommodate the increase in marine traffic and became an important lake port. In 1835, nearly 2,000 boats docked in Cleveland, 70 of which were from foreign ports. Though Cleveland was an important lake port by the early 1800's, its industrial development didn't begin until the 1840's — a time when Cleveland began to benefit from iron ore from Lake Superior and coal from Pennsylvania and the South.

Two Cleveland companies owned the mining rights to a large part of Lake Superior's mining district and in 1842 began shipping iron ore from these mines to Cleveland in lake barges. At the same time, important coal deposits were discovered in Pennsylvania, Southern Ohio and West Virginia. Cleveland became a logical meeting place for coal from the South and East and iron ore from the North. It became the capital of the Great Lakes iron and coal trade. The meeting of the iron ore and coal trades led to the formation of new industries.

Cleveland started its first steel-making operations in the 1840's. To transport the iron ore from the upper lakes, boats had to be built and Cleveland became a major Great Lakes shipbuilding center. In the 1860's, John D. Rockefeller began Cleveland's first refinery, shipping oil in from Pennsylvania oil fields. By the 1890's, Rockefeller controlled 90 percent of the nation's oil manufacturing trade; and Cleveland became the nation's oil capital for the next 40 years. Other industries sprang up to store and deliver oil refined products. By the end of the 19th century,

Cleveland's economy experienced tremendous growth and diversification. In 1890, 11 railroads served Cleveland. The city's manufacturing establishments grew to 2,300, and products manufactured doubled. The city's population reached 497,502 by 1900, nearly tripling in 30 years.

Cleveland's industrial growth continued into the 20th century with the birth of the automobile industry. With Cleveland's role as a center for production of iron and steel, it seemed a logical progression that Cleveland should also play an important part in the nation's emerging auto industry. One of the first automobiles manufactured in the world, the Winton car, was produced in Cleveland in 1897. The first automobile built for sale — an ice-cooled one-cylinder engine for \$2,000 — was sold here by Alexander Winton. By the turn of the century, Cleveland had six major automakers. By 1914, Cleveland had emerged as the nation's No. 1 automaker with an estimated 30 percent of every dollar invested in the U.S. auto industry. The area held this position until the end of World War I, when the auto center shifted to Detroit. More than 80 different makes of automobiles have been built in Cleveland at one time or another.

Cleveland's population and economy continued its rapid growth in the 1900's until the 1960's, and today it is one of the nation's largest economic centers. The seven-county Cleveland Consolidated Metropolitan Statistical Area has a population of more than 2.7 million, ranking 12th in the nation.

Cleveland also is a corporate center, with headquarters for many of the nation's largest companies. Cleveland is the headquarter for 28 of the leading corporations, ranking 4th in the number of *Fortune* 500 industrial corporate headquarters and 12th in the number of non-industrial corporate headquarters. More than 90 companies with annual revenues of more than \$100 million have headquarters in the Cleveland metropolitan area.

Cleveland has also become a nationally recognized medical center. Approximately 50,000 Cleveland workers are employed in health-related industries. Cleveland has become a world leader in medical research, especially in the development of new biomedical technologies.

Components of Change

Until recently, growth has characterized Cleveland's economy. Basic structural changes caused by national, rather than local forces, have resulted in a slowdown in the

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Cleveland economy and other manufacturing centers in the Northeast and North Central regions since the mid-1960's. In addition, total employment in Cleveland is significantly influenced by cyclical trends in the manufacturing sector, expanding and contracting as manufacturing employment increases and decreases during business cycles. Structural and cyclical patterns in Cleveland's total employment trends reflect the divergent trends of the manufacturing and non-manufacturing sector. The long-term change in total employment reflects the growth in the non-manufacturing sector. Until the most recent recession, this sustained growth in the non-manufacturing sector was large enough to offset the decline in manufacturing employment during the last two decades.

On the other hand, short-term cyclical changes in total employment are better explained by the performance of the manufacturing sector. Short-term cyclical downturns in manufacturing are severe enough to pull down total employment, although manufacturing represents only about 24 percent of the total.

Though current employment trends may suggest that Cleveland's economy is stagnant, there are in fact many dynamic forces at work. Changes in total employment over a period reflect only a net change. It is a residual of six components of employment change that hides the dynamic characteristics of the Cleveland economy. Employment gains occur as firms start up and as existing firms expand or migrate to the area. Employment losses occur because of firms that go out of business, contractions caused by layoffs, and outmigration of establishments from the area.

Several revealing findings emerge when looking at the components of employment change. According to a recent study by the Regional Economic Issues Program (Eberts, 1984), there is a significant amount of employment turnover in the Cleveland area. During a period of expansion from 1976-78, total employment in the Cleveland area grew by 20,000 workers. Looking at the components of employment change reveals that more than 220,000 new jobs were added to the local economy while 200,000 were lost.

Therefore, during this two-year period the employment turnover in the Cleveland area amounted to more than 400,000 workers, or slightly less than 50 percent of Cleveland-area jobs. This was significantly higher than the U.S. turnover rate, which was about 35 percent.

Which components of employment change have the greatest impact on the Cleveland economy? Cleveland's rate of job loss through business closings, contraction or outmigration is not significantly different than the national rate. Gross job-loss rates from these three components of employment change are similar in nearly all metropolitan areas. Even high-growth areas in the South and Southwest lost about the same percentage of jobs from these components as areas in the North (Rand, 1982: 29-30).

Also, migration of firms cannot explain employment change in Cleveland. Outmigration of firms leaving the area account for less than 1 percent of Cleveland's employment loss; and, conversely, less than 1 percent of the area's employment gains are because of firms moving into Cleveland. Migration of businesses was an insignificant factor in explaining employment change both locally and in other metropolitan areas in the United States (Rand, 1982: 29-30).

Instead, a study of the Regional Economic Issues Program revealed that the key component to employment change in the Cleveland area is the start-up of new businesses. During the 1976-78 expansion period, start-ups increased employment by 15 percent. But during the 1980-82 recessionary period, employment gains from business start-ups dropped to 9.4 percent. In contrast, employment changes due to business closings, contractions and expansions were similar during both expansion and recession periods in the Cleveland area. As a result, nearly all of the reversal in employment change from the period of expansion to recession was caused by the decrease in jobs created from business start-ups.

Table 1
Manufacturing Employment / (thousands)
(Cleveland PMSA)

Industry Category	1985	Percent
Total	862.8	100%
Manufacturing	210.1	24.4%
Durable Goods	145.9	16.9%
Primary Metals	23.5	2.7%
Blast furnace & basic steel products	10.8	1.3%
Iron & steel foundries	5.5	0.6%
Fabricated Metal Products	33.1	3.8%
Fabricated structural metal products	3.7	0.4%
Screw machine products, bolts, etc.	4.8	0.6%
Metal forgings and stampings	11.1	1.3%
Machinery, Excluding Electrical	32.5	3.8%
Construction and related machinery	3.2	0.4%
Metalworking machinery	10.4	1.2%
Special industry machinery	3.6	0.4%
General industrial machinery	2.9	0.3%
Electric & Electronic Equipment	18.9	2.2%
Electrical industrial apparatus	7.1	0.8%
Transportation Equipment	20.1	2.3%
Motor vehicles and equipment	12.8	1.5%
Instruments and related products	8.3	1.0%
Measuring and controlling devices	4.2	0.5%
Non-durable Goods	65.1	7.5%
Food and kindred products	7.3	0.8%
Apparel and other textile products	4.7	0.5%
Paper and allied products	5.5	0.6%
Printing and publishing	15.5	1.8%
Chemicals and allied products	14.2	1.6%
Rubber and misc. plastics products	12.1	1.4%
Non-manufacturing	652.6	75.6%

Trends

Cleveland is located in the industrial heartland of the United States; and like many Northeastern and Great Lakes metropolitan areas, its role in the U.S. economy is that of a manufacturer of durable goods.

In 1985, manufacturing employment in the Cleveland area averaged 210,000, or about 24 percent of total employment, compared with 20 percent nationally. Manufacturing employment in the Cleveland PMSA is concentrated in durable goods production, but is relatively diversified within durable goods. About 69 percent of Cleveland's total manufacturing employment is engaged in durable goods production, compared with 59 percent in the United States. The five largest durable goods industries that comprise Cleveland's traditional anchor industries include primary metals, fabricated metals, non-electrical machinery electrical machinery and transportation equipment.

The diversity of Cleveland's manufacturing sector is one of the city's major strengths. Within the manufacturing sector, only New York and Saint Louis are more diverse at the three-digit S.I.C. code level. And in major durable goods production industries, Cleveland is far more diversified than any other metropolitan area in the United States. This, and other factors, refute the conception that the Cleveland area is almost entirely dependent on the auto and steel industry or that Cleveland's anchor industries are primarily suppliers of the auto industry (Rand, 1982).

Other evidence can be seen when looking at the export employment of these industries. The Rand study concluded that the Cleveland industry's export-orientation is the most influential stimulant to the local economy. Yet less than 50 percent of employees in Cleveland's motor vehicle industry, and less than 10 percent of the area's employees in the primary metals industry, are producing for export. In contrast, other major durable goods industries have about 80 percent or more of their employment in export production. Other evidence shows that during the expansion period of the last business cycle, both total and export employment in the motor vehicle and steel industries were declining, while total and export employment were increasing in the fabricated metals and non-electrical machinery industries. This suggests that Cleveland's major export industries export to many different kinds of businesses. Decreases in auto and steel sales during this period were offset by increased sales in other industries (Rand, 1982:41).

During the recent recession, the auto, steel and related industries showed a dramatic decline in employment. If these industries were the primary determinants of Cleveland's economic health, many other area industries would have had similar rates of decline, but this did not happen.

While the auto and steel industries are important to Cleveland's economy, the area's economic diversity prevents these industries from being the sole determinants of Cleveland's economic future. Cleveland's diversity pro-

vides a variety of opportunities for economic development.

Though Cleveland's economy can be influenced by various events, changes in the export-orientation of Cleveland's major industries have the greatest impact on stimulating Cleveland's economy. Based on earning multipliers (a measure of how much total local income will be generated by an increase in export business) and estimates of export employment for individual Cleveland industries developed by the Rand Corporation, Cleveland's manufacturing durable goods industries have the greatest impact on Cleveland's economy. Cleveland's durable goods industries generate a higher total income in the area by an increase in export business than most other Cleveland industries. The significant impact that durable goods industries have on the Cleveland economy is in contrast to many other metropolitan areas in the United States, where most local income generated by an increase in export business is in the service sector.

"The diversity of Cleveland's manufacturing sector is one of the city's major strengths."

Looking at Cleveland's traditional anchor industries within durable goods reveals more specifically that Cleveland's economic specialty is as an exporter of producers' durable goods, especially fabricated metal products, non-electrical machinery products and electrical equipment products. These industries have both a very large number of export employees and a high proportion of their total employment in export production. For example, Cleveland's fabricated metals industry has an estimated 26,000 more employees than were needed to meet local demand for their products. In contrast, Cleveland's rubber products industry would have to hire 8,000 more employees to meet local demand.

Overall trends in Cleveland's manufacturing sector reflect the long-term structural changes occurring in the national economy; that is, from a manufacturing to a consumption-oriented society resulting in a decrease in manufacturing employment, especially in durable goods, and an increase in non-manufacturing employment, especially in the service sector. Cleveland's manufacturing employment began to decline in the mid-60s, from a peak of 306,800 workers in 1967 to 210,100 employees in 1985 with the most severe losses occurring in the recent back-to-back recessions.

The leading causes of Cleveland's long-term losses in manufacturing employment are national and international in scope. They include: (1) changes in demand for specific manufactured goods; (2) changes in industry structure and competitiveness affecting the traditional durable goods sector; (3) national shift to the South and



Southwest which in turn has resulted in the redistribution of the markets for manufactured products; and (4) development of locational advantages in other areas. In addition, Cleveland's specific role in the U.S. economy is that of an exporter of producer durable goods in the manufacturing sector, buying inputs from other factories and selling the parts and equipment it manufactures to other factories. Consequently, Cleveland's export income is more sensitive to shifts in the national manufacturing sector than many other metropolitan areas.

Looking at employment trends only in Cleveland's major manufacturing sectors indicates a rather dismal outlook for Cleveland's economic future. However, if one looks at component industries of these major groups there is substantial diversity in performance among industries, and a number have done well in maintaining their market share of national employment. These include electrical industrial apparatus, general industrial machinery and miscellaneous durable goods manufacturing (Kingsley, 1982: 41). Several industries have increased employment since 1979. They are instruments and related products, paper and allied products, and printing and publishing in the non-durable goods sector.

In contrast to the long-term decline in the manufacturing sector, Cleveland's non-manufacturing employment has continued to grow, absorbing much of the job losses in the manufacturing sector. Between 1973 and 1985, non-manufacturing employment increased by 61,000, or 10 percent. Within the non-manufacturing sector, the services industry — particularly health and business-related services — had the most rapid employment growth.

Although the service sector has shown strong growth, on closer examination there appears to be little evidence to conclude that Cleveland's economic future rests solely with the service industries. First, while there has been significant employment growth in the majority of Cleveland's non-manufacturing industries, the majority were growing more slowly in Cleveland than at the national level, including Cleveland's fastest growing non-manufacturing industries. Not only are the vast majority of Cleveland's non-manufacturing industries losing their market share of U.S. employment and are therefore not competitively strong, but their national shares also remain substantially below those of most manufacturing industries. Industries in which Cleveland is both competitively strong in the U.S. market and has a significant share of U.S. employment are still concentrated in the manufacturing sector.

Secondly, many of Cleveland's strongest non-manufacturing industries are those directly tied to the local production of goods (including trucking and warehousing) and administrative and auxiliary activities (including headquarter offices). Therefore, the health of the non-manufacturing sector is dependent on the strength of the manufacturing sector. Thirdly, while Cleveland's non-manufacturing sector is large in terms of total employment, the majority of Cleveland's export employment remains in durable goods manufacturing, which has greater potential of economic growth due to its associated higher earning

multipliers.

This does not suggest that the non-manufacturing sector is not important to Cleveland's economic well-being. The service sector is a critical component of Cleveland's economy. Cleveland's advantages as a headquarters location and its strength and continuing growth in business-related and health services are important to Cleveland's future. Efforts should continue in development of the service sector to prevent these advantages from eroding. But strong forces shifting the national economy to a service orientation, and the corresponding decrease in local manufacturing employment, does not reflect a change in Cleveland's role in the U.S. economy. Cleveland's greatest strength — its economic specialty and unique role in the national economy — still lies as an exporter of producer durable goods; and support for these manufacturing industries are critical to Cleveland's economy. Because many Cleveland non-manufacturing industries are closely tied to manufacturing, development strategies for non-manufacturing should compliment the manufacturing sector and promote interaction between the two sectors.

Due to Cleveland's specific role in the U.S. economy as an exporter of producer durable goods in the manufacturing sector, the current trends in Cleveland's economy are influenced more by structural and cyclical changes in the national economy than by local economic factors. Cleveland's economic future is also dependent on national responses to boost a sagging manufacturing sector. The key factor to the nation's and Cleveland's future in manufacturing is the amount of new investment in manufacturing plants and equipment. Because exports are the major factor stimulating Cleveland's economy, Cleveland's competitive position in U.S. and world markets is a key determinant of its economic health. For Cleveland and the nation to be competitive, the manufacturing sector must continue to modernize.

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Recession and Recovery in Ohio's Industries

By Dixie Sommers

Overview

Ohio continued on its course of job recovery in 1985, although not as rapidly as in 1984. Last year, the state set a new record for the number of persons in the labor force and experienced modest gains in total employment and non-farm wage and salary employment. Unemployment continued to decline, with the unemployment rate averaging 8.9 percent for the year, compared with 9.4 percent in 1984. Industry employment patterns ranged from healthy increases in construction, trade and services, to declines in manufacturing and mining.

This article reviews these job indicators for 1985, looking at the year in comparison with 1984. It also discusses the state's job losses and recovery between 1979 and 1985 and examines the effects of Ohio's manufacturing industry structure and national manufacturing employment trends.

The Ohio Labor Force in 1985

Ohio's working-age population and labor force reached all-time highs in 1985. (See Table 1.) The working-age population grew by 24,000 persons, reaching a new level of 8.065 million. The civilian labor force increased by 41,000, reflecting the increase in the working-age population and a small rise in the labor force participation rate. The participation rate, which is the portion of the working-age population in the work force, reached 63.6 percent, also an all-time high for Ohio.

Total employment rose by 66,000, or 1.4 percent in 1985, with an average of 4.675 million Ohioans working during the year. Employment remained below its record annual level of 4.760 million in 1979, but 1985 had the highest level since that year. (See Footnote 1.) The number of Ohioans out of work declined in 1985 by 25,000, reaching a new level of 455,000. The unemployment rate also fell, from 9.4 percent in 1984 to 8.9 percent in 1985. Although this modest decline in the unemployment rate shows continuing recovery, it remained uncomfortably high for the year. Among all states, Ohio tied with Alabama for the eighth highest rate, and was above the national yearly average of 7.2 percent.

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Industry Employment Trends in 1985

While the aggregate labor force data are helpful in summarizing Ohio's employment condition, they do not provide detailed information on the underlying economic trends. For this purpose, data on the state's non-agricultural wage and salary employment by industry are most useful. (See Footnote 2.) According to these data, Ohio's employment rose by 2.8 percent between 1984 and 1985 — a rate higher than the 1.4 percent indicated by the labor force data. The level of employment rose by 118,000 jobs to 4.379 million for the year. (See Table 2.) As with the labor force data, the industry figures show that in 1985 Ohio had not yet returned to its pre-recession record annual job level of 4.485 million reached in 1979.

Ohio continued to follow general national trends in 1985, with the bulk of the job gains coming in the larger non-manufacturing industries, and with declines in manufacturing and mining. Manufacturing industries declined further as a share of total employment in Ohio and in the nation, accounting for 25.6 percent of all non-farm Ohio jobs and 19.9 percent nationally.

In the non-manufacturing sector, three industry groups showed healthy gains in the number of jobs during the year. Construction grew by 6.4 percent, representing the addition of 9,000 jobs and spurred mostly by declines in interest rates late in the year, which boosted housing starts and other construction activity. The retail-trade sector grew at a 5.6 percent rate, gaining 42,000 jobs, with the most rapid growth in eating and drinking places and automobile dealers and service stations. The special financing offers on new cars, declining interest rates and general improvement in personal income levels were probably the most important factors in the job growth in retail trade. Finally, the service-industry sector showed a 5.3 percent increase in employment, gaining 48,000 jobs over the year. This sector has shown strong growth in Ohio and nationally during most of the recovery period, with particular strength shown in business services and health services, except for hospitals.

All other industry groups in the non-manufacturing sector showed job growth in 1985, with the exception of mining and transportation, communications and public utilities. Declines in railroad and communications employment were not entirely offset by the small gains in other transportation and utility industries.

The manufacturing sector in 1985 continued to be a disappointment. Industries in this sector apparently reached the end of their recovery in 1984 and began to show job declines in 1985. A variety of factors were at

work, including competition from foreign producers made more difficult by the high value of the dollar relative to foreign currencies. The trade-weighted dollar value peaked in February 1985 and began to fall rapidly in the last few months of the year. The impact of this improvement was not reflected in the 1985 job figures, as several months' time lag is expected. Manufacturing employment was also affected by continuing problems in the steel and machine tool industries, and by productivity improvements that generally strengthened the competitive positions of some industries but probably reduced the number of jobs.

Manufacturing industries showed an overall 0.3 percent decline in employment in 1985, representing a loss of about 4,000 jobs. This decline was all in the durable goods sector, which fell by 0.6 percent. Non-durable goods employment was virtually unchanged.

Among durable goods manufacturing industries, only the transportation equipment industry showed strong job growth during the year. This growth was largely found in the aircraft and parts sector, which expanded at an 11.9 percent rate, while the motor vehicles sector gained jobs at a 2.1 percent rate. The strong growth for the aircraft sector was largely because of defense-related expansions.

The remaining major durable goods sectors declined in employment, with the most rapid decline found in the primary metals industry, dropping by 5.7 percent, or 6,000 jobs. This loss reflects many factors in the troubled steel industry, including company reorganizations, work stoppages that depressed employment in several months, depressed steel demand, worldwide overcapacity, and foreign competition. Significant employment declines were also seen in electric and electronic equipment production and stone, clay and glass products.

In the non-durable goods manufacturing sector, employment grew significantly only in the printing and publishing industry, which gained about 2,000 jobs, representing a 2.3 percent rate of growth. This gain was mostly offset by job losses in food products and chemicals and allied products.

Table 1
Labor Force Estimates for Ohio, 1984-1985

Labor Force Estimate	1984	1985	Change	Percent Change
Working-age population	8,041,000	8,065,000	24,000	0.3%
Civilian labor force	5,089,000	5,130,000	41,000	0.8%
Total employment	4,609,000	4,675,000	66,000	1.4%
Total unemployment	480,000	455,000	-25,000	-5.2%
Rates (Percentages)				
Labor force participation rate	63.3%	63.6%	—	—
Employment/population ratio	57.3%	58.0%	—	—
Unemployment rate	9.4%	8.9%	—	—

Source: Bureau of Labor Statistics

Metropolitan Industry Trends

As in past years, the growth in non-agricultural wage and salary employment varied greatly among Ohio's largest metropolitan areas. Comparisons among the eight areas for which Current Employment Statistics survey data are tabulated show overall growth rates, ranging from 5.2 percent in Columbus and 4.6 percent in Cincinnati to 1.7 percent in Cleveland and 0.8 percent in Youngstown-Warren. (See Table 3.) These variations are at least partly the result of different industry employment structures among the areas. Cleveland and Youngstown continue to suffer from losses in durable goods manufacturing, partic-

Table 2
Non-Agricultural Wage and Salary Employment in Ohio, 1984-1985

Industry Group	Employment (thousands)		Change	Percent Change
	1984	1985		
Total Employment	4,260	4,379	118	2.8%
Manufacturing	1,127	1,123	-4	-0.3%
Durable Goods	773	769	-4	-0.6%
Stone, clay and glass products	53	50	-2	-4.0%
Primary metal industries	109	103	-6	-5.7%
Fabricated metal products	139	139	0	0.1%
Non-electrical machinery	167	166	-1	-0.7%
Electric & electronic equipment	93	91	-3	-2.8%
Transportation equipment	145	152	7	4.7%
Non-durable Goods	354	354	0	0.1%
Food and kindred products	63	63	0	-0.2%
Printing and publishing	65	67	2	2.3%
Chemicals and allied products	63	62	0	-0.5%
Rubber and misc. plastics products	91	91	0	0.2%
Non-manufacturing	3,133	3,256	122	3.9%
Mining	28	26	-1	-5.0%
Construction	145	154	9	6.4%
Special trade contractors	89	95	6	7.2%
Transportation & Public Utilities	204	203	-1	-0.7%
Transportation except railroads	93	95	2	2.4%
Communication, electric & gas	92	90	-2	-2.2%
Wholesale Trade	237	247	10	4.1%
Durable goods	150	157	7	4.5%
Non-durable goods	87	90	3	3.6%
Retail Trade	748	790	42	5.6%
General merchandise stores	115	113	-1	-1.0%
Food stores	120	126	5	4.3%
Auto dealers & gas stations	82	87	5	6.3%
Eating and drinking places	258	277	19	7.3%
Finance, Insurance & Real Estate	212	218	7	3.2%
Banking	58	60	2	2.8%
Insurance carriers	58	58	1	1.2%
Services	905	953	48	5.3%
Personal services	49	52	3	6.8%
Business services	153	174	21	14.0%
Health services	322	329	7	2.1%
Educational services	58	60	1	2.4%
Government	655	665	10	1.4%
Federal government	89	92	2	2.6%
State government	141	143	2	1.6%
Local government	425	430	5	1.2%

Source: Ohio Bureau of Employment Services, Labor Market Information Division. Includes major industry divisions and industry groups with 50,000 or more jobs in 1985. The change and percent change are calculated from data not rounded to the nearest thousand.



Table 3
Percent Change in Non-Agricultural Wage and Salary Employment, 1984-1985,
by Industry Division and Metropolitan Statistical Area

	Percent Change in Employment, 1984-1985							Youngstown- Warren
	Akron	Canton	Cincinnati	Cleveland	Columbus	Dayton- Springfield	Toledo	
Total Employment	2.4%	2.1%	4.6%	1.7%	5.2%	3.8%	2.9%	0.8%
Manufacturing	0.0%	-0.2%	1.5%	-1.4%	1.1%	2.6%	1.2%	-4.7%
Durable goods	1.1%	-0.9%	2.3%	-1.7%	1.9%	2.8%	1.2%	-5.0%
Non-durable goods	-1.2%	2.7%	0.5%	-0.9%	0.0%	2.1%	1.5%	-1.9%
Non-manufacturing	3.3%	3.1%	5.5%	2.8%	6.1%	4.3%	3.4%	3.1%
Construction	9.2%	12.2%	6.8%	0.7%	12.0%	12.4%	7.6%	14.5%
Transportation & public utilities	-1.5%	-3.2%	3.7%	-0.7%	-0.8%	-1.4%	-2.1%	-2.6%
Wholesale trade	3.1%	1.3%	4.3%	2.8%	6.7%	3.8%	-1.3%	7.3%
Retail trade	4.7%	5.1%	6.4%	3.5%	8.4%	5.6%	5.5%	4.0%
Finance, insurance & real estate	4.3%	0.0%	4.1%	1.9%	5.1%	3.7%	5.2%	2.8%
Services	3.4%	4.5%	7.6%	4.9%	8.5%	5.9%	4.3%	2.2%
Government	1.5%	0.0%	2.3%	0.5%	2.1%	1.0%	2.3%	0.9%

Source: Ohio Bureau of Employment Services, Labor Market Information Division

Table 4
Ohio Employment Losses and Recovery by Industry Group, 1979 - 1983 - 1985

Industry Group	Non-Agricultural Wage and Salary Employment			Employment Change		
	1979	1983	1985	79-83	83-85	79-85
Total Employment	4,485	4,093	4,379	-392	286	-106
Manufacturing	1,382	1,066	1,123	-316	57	-259
Durable Goods	981	724	769	-257	46	-211
Stone, clay and glass products	70	52	50	-18	-2	-19
Primary metal industries	159	104	103	-55	-1	-56
Fabricated metal products	176	130	139	-46	9	-37
Non-electrical machinery	224	154	166	-69	12	-57
Electric & electronic equipment	118	89	91	-28	1	-27
Transportation equipment	166	132	152	-34	20	-14
Non-durable Goods	402	342	354	-59	12	-48
Food and kindred products	74	63	63	-11	-1	-12
Printing and publishing	68	63	67	-5	4	-1
Chemicals and allied products	68	63	62	-5	-1	-6
Rubber and misc. plastics products	107	83	91	-24	8	-16
Non-manufacturing	3,103	3,027	3,256	-76	229	153
Mining	32	27	26	-5	0	-5
Construction	183	131	154	-52	23	-29
Special trade contractors	106	79	95	-26	16	-11
Transportation & Public Utilities	232	199	203	-34	4	-30
Transportation except railroads	107	86	95	-21	9	-12
Communication, electric & gas	93	93	90	0	-3	-3
Wholesale Trade	233	223	247	-10	24	14
Durable goods	152	140	157	-12	17	5
Non-durable goods	81	83	90	2	7	9
Retail Trade	742	711	790	-31	79	47
General merchandise stores	129	112	113	-18	2	-16
Food stores	117	117	126	0	8	9
Auto dealers & gas stations	89	76	87	-13	11	-2
Eating and drinking places	229	243	277	14	34	48
Finance, Insurance & Real Estate	201	208	218	7	11	18
Banking	57	59	60	1	1	3
Insurance Carriers	58	58	58	0	0	0
Services	806	873	953	67	80	147
Personal services	47	47	52	0	5	5
Business services	119	131	174	11	43	55
Health services	265	319	329	54	10	64
Educational services	54	58	60	4	2	6
Government	674	656	665	-18	9	-9
Federal government	91	89	92	-2	3	1
State government	138	140	143	2	3	5
Local government	445	427	430	-18	3	-15

Source: Ohio Bureau of Employment Services, Labor Market Information Division. Includes major industry divisions and industry groups with 50,000 or more jobs in 1985

ularly steel and machine tools. Areas with economies less dependent on manufacturing, such as Columbus and Cincinnati, continue to fare better than the state average.

Non-manufacturing industries showed job growth in all eight areas at rates at or above the state average of 2.8 percent for all industries. Non-manufacturing jobs grew fastest in Columbus, at 6.1 percent, and in Cincinnati, at 5.5 percent. Non-manufacturing jobs grew slowest in Canton and Youngstown-Warren, both at 3.1 percent, and in Cleveland, at 2.8 percent.

Manufacturing showed a variety of patterns among the metropolitan areas, ranging from an increase of 2.6 percent in Dayton-Springfield to a decline of 4.7 percent in Youngstown-Warren. Declines were also found in Canton, down 0.2 percent, and Cleveland, down 1.4 percent. The manufacturing growth in the Dayton-Springfield area was fairly well balanced between durable and non-durable goods jobs, reflecting small gains spread across the area's manufacturing base. The largest gain was 1,400 jobs in transportation equipment production. On the opposite end of the scale, Youngstown-Warren lost both durable and non-durable goods manufacturing jobs, although the 5.0 percent rate of loss in durable goods was much higher than the 1.9 percent loss in non-durables. Durable goods losses were mostly in primary metal industries.

Nearly all areas showed strong job growth in construction. Youngstown-Warren showed the strongest gain, at 14.5 percent, reflecting construction activity to repair the damage caused by the May 1985 tornadoes. Canton, Columbus and Dayton-Springfield also had double-digit job growth in construction, while Cleveland's growth was only 0.7 percent.

Transportation, communications and public utilities lost jobs in all areas except Cincinnati. The trade sectors showed generally strong growth in employment across all eight areas, with retail trade growing faster than wholesale in all areas except Youngstown-Warren. The only job loss in trade was a 1.3 percent decline in wholesale trade jobs in the Toledo area. The finance, insurance and real estate sector grew in all areas except Canton, where it was unchanged. The most rapid job growth in the finance sector was in Toledo and Columbus, at 5.2 and 5.1 percent respectively.

The services industry gained jobs at a healthy pace in nearly all metropolitan areas, with rates of growth ranging from 8.5 percent in Columbus and 7.6 percent in Cincinnati, to 2.2 percent in Youngstown-Warren. Government employment was either unchanged or grew slowly in most areas, with the most rapid rate of growth at 2.3 percent for Cincinnati and Toledo.

Table 5
Analysis of Ohio Manufacturing Employment Change, 1979-1985

Industry Group	Change in Wage and Salary Employment (thousands)		
	Actual Change	Expected Change with U.S. Rate of Change	Actual Change Minus Expected Change
Manufacturing	-259	-165	-94
Durable Goods	-211	-153	-58
Stone, clay and glass products	-19	-11	-8
Primary metal industries	-56	-60	4
Fabricated metal products	-37	-26	-11
Non-electrical machinery	-57	-35	-23
Electric & electronic equipment	-27	-7	-20
Transportation equipment	-14	-12	-2
Non-durable Goods	-48	-12	-36
Food and kindred products	-12	-5	-7
Printing and publishing	-1	11	-12
Chemicals and allied products	-6	-4	-2
Rubber and misc. plastics products	-16	-4	-11

Table 6
Analysis of Ohio Manufacturing Employment Change, 1979-1983 and 1983-1985

Industry Group	Change in Wage and Salary Employment (thousands)		
	Actual Change	Expected Change with U.S. Rate of Change	Actual Change Minus Expected Change
Recession Period, 1979-1983			
Manufacturing	-316	-237	-80
Durable goods	-257	-209	-48
Non-durable goods	-59	-27	-32
Recovery Period, 1983-1985			
Manufacturing	57	65	-8
Durable goods	46	51	-6
Non-durable goods	12	14	-2

Recession and Recovery in Ohio Industries

In 1985 Ohio continued to recover from the job losses suffered during the recessions of the early 1980's, although the jobs being gained are not always directly replacing the jobs lost. Table 4 shows the annual average non-farm payroll employment by industry for: 1979, the most recent year of peak employment; 1983, the recession trough; and 1985. The table also shows the employment changes between: 1979 and 1983; 1983 and 1985; and 1979 and 1985.

Across all industries, Ohio lost 392,000 jobs between 1979 and 1983. About 316,000 of these jobs were in manufacturing, which bore the brunt of the downturn, especially in durable goods. Non-manufacturing also lost significant numbers of jobs, particularly in construction, transportation and public utilities, and trade. The only sectors which gained jobs during the period were finance, insurance and real estate, which added about 7,000 jobs, and the service sector, which added 67,000, mostly in health services.

Within manufacturing, the largest job losses were in the basic industries, which usually are cyclical and were especially hard hit by the recession's combination of declining demand and intense foreign competition fostered by high U.S. interest rates, high dollar values and lack of competitiveness among some American producers. Ohio lost 55,000 jobs in primary metals, mostly in basic steel production; 46,000 jobs in fabricated metal products; 89,000 jobs in non-electrical machinery; 28,000 jobs in electric and electronic equipment; and 34,000 jobs in the transportation equipment sector, mostly in auto production. In the non-durable goods industries, the largest losses were in rubber and miscellaneous plastics products.

During the recovery period of 1983-85, Ohio gained about 286,000 jobs, but remained 106,000 below the 1979 peak. Only 57,000 of the jobs gained were in manufacturing, compared with the 316,000 lost. In 1985 Ohio's manufacturers provided 259,000 fewer jobs than before the recession. A significant part of this problem is structural, since Ohio's manufacturing sector is dominated by the industries which nationwide suffered the heaviest losses and have had the slowest recovery or have continued to show losses, such as the glass and steel industries. Last year, all of the state's important manufacturing industries remained below their 1979 employment levels. (The latter part of this article discusses Ohio's manufacturing structure in more detail.)

The largest number of manufacturing jobs gained since 1983 has been in the transportation equipment sector, which was up by 20,000 over the two years. The non-electrical machinery industry had the next largest growth, all of which occurred in 1984. This sector declined in 1985, as discussed earlier.

In non-manufacturing, Ohio has more than fully recovered its job losses in wholesale and retail trade, and has seen further growth in the finance and services

sectors, which did not lose jobs during the recession. The improvement in retail trade has been uneven, however, with general merchandise stores, auto dealers and gas stations still below their 1979 levels. Government employment also was below its 1979 level, with gains in federal and state government employment moderated by slower improvement in the local government sector, mainly local public education.

Among all industries, the largest number of jobs gained since 1979 is found in health services, which gained 64,000. Nearly all of this improvement was in the non-hospital sector. Employment in hospitals has fallen since 1979 because of cost-cutting measures resulting in fewer and shorter hospital stays and less expensive outpatient care. Employment in nursing homes, clinics and offices of health practitioners has grown quickly, more than offsetting the losses in hospitals. Business services have also gained significant numbers of jobs, up 55,000 since 1979.

Effects of Ohio's Manufacturing Structure

The severe job losses in Ohio's manufacturing industries between 1979 and 1983, and the relatively small number of factory jobs recovered, raise questions about the effects of the structure of the state's economy on its cyclical performance. It should be expected that Ohio will fare worse than the nation during a cyclical downturn, because the sensitive manufacturing sector accounts for a larger part of the state's jobs than of the nation's. In 1979, manufacturing provided 30.8 percent of Ohio's non-farm payroll jobs, compared with 23.4 percent of the nation's. More than 70 percent of Ohio's factory jobs were in durable goods industries.

How much of Ohio's manufacturing downturn reflects the nationwide decline of the particular set of industries found here? The analysis presented below suggests that of the 259,000 manufacturing jobs lost between 1979 and 1985 about 165,000, or about 64 percent, were lost because of the national declines. The remaining loss of 94,000 must be attributed to the shift of jobs in Ohio's important industries to other regions.

Table 5 presents the results of an analysis of employment change in Ohio's manufacturing sectors. The table shows the actual employment change between 1979 and 1985 for the larger industry groups. The table also shows the change in employment that would be expected if the U.S. rates of change between 1979 and 1985 were applied to Ohio's 1979 employment levels. Calculation of this "expected" change was done by using data at the three-digit industry level in an attempt to account for the dominance or absence of certain industries in the state. In the non-electrical machinery industry, for example, use of finer detail makes allowance for the fact that in Ohio this sector is heavily tilted toward metal-working machinery and general industrial machinery, which suffered losses nationally. In this same sector, Ohio has relatively few jobs



in computer and office equipment manufacturing, which grew rapidly during the recession. (See Footnote 3.)

Table 5 also shows the difference between the actual and the "expected" job losses. These figures may be considered to represent the manufacturing job losses or gains in Ohio not attributable to the overall national rates of employment change by detailed industry.

The analysis shows somewhat different results for durable and non-durable goods industries. For durable goods, the loss of 153,000 jobs expected from national decline accounts for about 73 percent of the 211,000 actual losses. For non-durables, national rates of employment change account for a loss of 12,000 Ohio jobs, or only 25 percent of the 48,000 actually lost.

Within the durables sector, the national rates of change for primary metal industries imply a greater loss for Ohio than actually occurred. This means that, while Ohio lost jobs in the steel industry between 1979 and 1985, the rate of loss was somewhat slower than nationally. Loss at the national rate would have resulted in an additional decline of 4,000 jobs. Review of the detailed data (not shown) indicates that about half of this additional decline would have been in the blast furnaces and basic steel sectors. As severe as these losses have been in Ohio, they are marginally less than national rates, even in the basic steel sector.

In all the remaining large durable goods industries, Ohio lost more jobs than expected from national rates of change. The largest difference — 23,000 — was in the non-electrical machinery industry, where Ohio's producers of machine tools, construction equipment and refrigeration equipment lost more jobs than expected. The electrical and electronic equipment industry lost 20,000 more jobs than expected from the national rate of loss. Most of these were scattered across detailed industries which are not large in Ohio; but a significant number were also attributed to Ohio losses in communications equipment manufacturing, which increased slightly nationwide. Fabricated metal products industries lost 11,000 more jobs than expected from national trends, while the transportation equipment sector lost only an additional 2,000. In the latter case, Ohio gained more jobs than expected in aircraft manufacturing, and lost slightly more than expected in motor vehicles.

In non-durable goods, most of the "extra" job losses were in printing and publishing, which grew nationally but declined slightly in Ohio, and in rubber and miscellaneous plastics products. Within rubber and plastics, Ohio's plastics employment was unchanged between 1979 and 1985, while the industry gained jobs nationally.

In interpreting the difference between Ohio's actual job losses and the changes expected because of national patterns, it may be useful to look at the data separately for the recession period and the recovery period. Table 6 presents an analysis for total manufacturing and durables and non-durables for these two periods. (See Footnote 4.) These data indicate that Ohio parted much further from national trends during the recession period than during the recovery, which in manufacturing has been modest for both the state and the nation.

Between 1979 and 1983, Ohio lost 316,000 manufacturing jobs, including 257,000 in durable goods and 59,000 in non-durables. If Ohio had followed national rates of change in each specific industry, the overall decline would have been 237,000, or about 75 percent of the actual loss. In durable goods, national trends account for a loss of 209,000, or 81 percent of the actual loss. In non-durables, national trends indicate a loss of 27,000 jobs, representing about 46 percent of the actual.

During the recovery period, Ohio has regained about 57,000 manufacturing jobs, about 8,000 less than expected because of national growth rates. Some 46,000 of the actual jobs gained have been in durable goods industries, about 6,000 less than expected. In non-durable goods, Ohio has recovered about 12,000 jobs, or 2,000 less than expected.

In general, it appears that at least during the most recent cycle, a significant part of Ohio's manufacturing job losses reflect the national trends for the specific industries found in the state. This is particularly apparent in the durable goods sector and during the recessionary period of the business cycle. Because these industries dominate Ohio's economy, the overall rate of job loss in Ohio is greater than the nation's. However, Ohio's industry structure and the national declines in Ohio's important industries do not account for all of the state's manufacturing losses.

The current picture suggests that Ohio will reach full recovery of its recessionary job losses in 1986, as measured on an annual basis. Recent declines in interest rates, oil prices and the value of the dollar may help stem the continuing losses in manufacturing and are likely to boost consumer spending and, consequently, employment in consumer goods and services industries.

Footnotes

¹ The monthly labor force data for 1986 so far show Ohio breaking its 1979 monthly peak employment level. The state began recording record high employment levels, as measured by the total employment data, beginning in February 1986.

² These data are from the Current Employment Statistics survey conducted by the Ohio Bureau of Employment Services in cooperation with the U.S. Department of Labor. This survey counts the number of wage and salary jobs, by place of work, through a survey of more than 10,000 non-farm employers in Ohio each month. Results of the survey are published in the Bureau's *Labor Market Review*. Detailed 1985 industry data will be available in the 1985 annual issue of the *Labor Market Review*.

³ Table 5 was calculated using the three-digit Standard Industrial Classification categories for which Ohio data are published in the *Labor Market Review*. Industries not published were treated as residuals, with employment levels calculated by subtracting data for published industries from the appropriate two-digit totals. National rates of growth for the residuals were used and may not reflect Ohio's structure adequately. A table showing the complete calculations is available upon request of the author.

⁴ The results for 1979-83 and 1983-85 cannot be summed to obtain the results for 1979-85 presented in Table 5, because the 1983-85 "expected" data were calculated by applying the national rates of employment change to Ohio's 1983 industry structure.





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